The SHIPPING WORLD

AND SHIPBUILDING & MARINE ENGINEERING NEWS

VOL. CXXV No. 3040 WEDNESDAY, OCTOBER 3, 1951 Price 1/6


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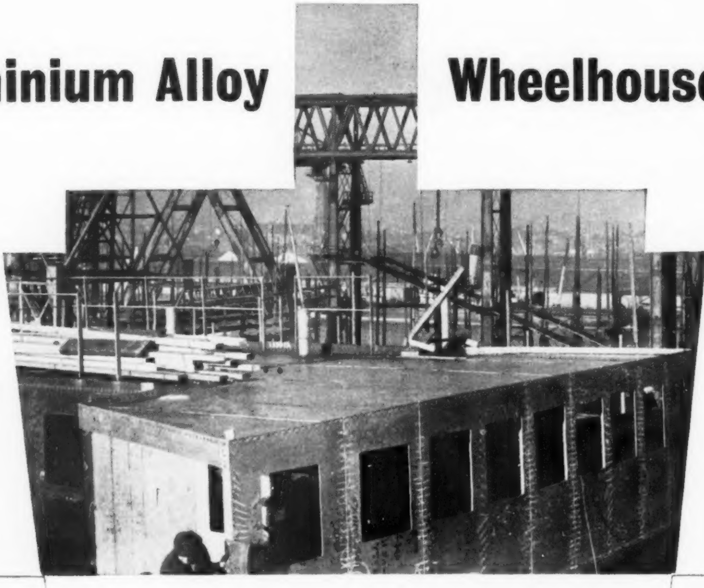

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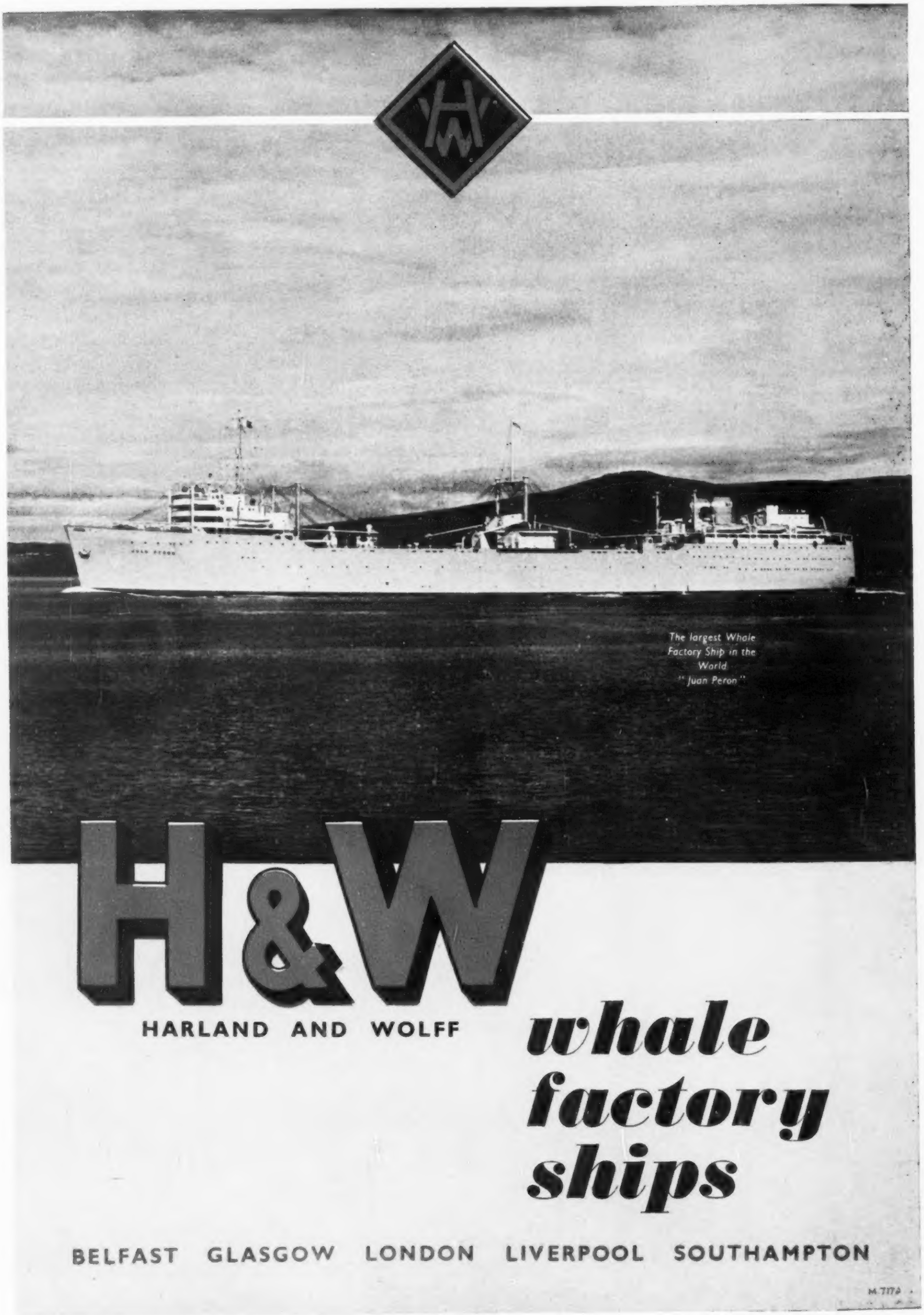
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The Oldest Weekly Journal devoted to Shipping, Shipbuilding, Marine Engineering, Shiprepairing, Insurance and Finance
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THE SHIPPING WORLD

THE FIGHT FOR INDUSTRIAL FREEDOM

The good old days are gone, and for ever. A new age has opened. In the 'tween-war years 1919-39 an experienced observer of events remarked that "the war, fought as we declared in the cause of abstract justice and closing with the promise of a new age of peace and prosperity, found an echo in the hearts of the workers and gave them a new enthusiasm". He suggested that the psychological effect of war is always unsettling because it causes the mind to break with habit and tradition, essential to the success of any revolution. "The succeeding period in which men are returning to their old work and picking up the old threads is always one of unrest and sometimes one of danger to the established order". In the past six years we have passed through a bloodless revolution unparalleled in our history. There has been a sustained attack on all the economic theories which were generally accepted in the early days of the century. The electors assumed, under leaders who should have known better and perhaps did know better, that thrift was an out-dated virtue, if it was indeed a virtue, that capitalism was a hateful system, while the great aim should be to create a shortage of skilled craftsmen so that wages might be forced up and hours of labour brought down. In pursuit of these ideas, Marshall Aid was accepted by the Socialist Government from the capitalist United States in order to found a Socialist regime in this country; one industry after another, which had been built up by private individuals, was taken over by the State, and costly welfare services were established. Now capital is no longer flowing into these islands from the other side of the Atlantic and we have to pay the price of a Welfare State without such temporary aid, with the result that we are living beyond our income and our trading account is sadly out of balance.

Such is the situation on the eve of the General Election. In the programme of none of the parties is any reference made to the permanent fact that the sea flows round our shores and that imports and exports have to be carried in ships. That should be as obvious to us as it was to our forefathers. It is true that the aeroplane has come on the scene, but our bulk trade will continue to be done almost entirely in ships, while most passengers will prefer to travel by sea, rather than by air. The services of the sea and air, are in fact, complementary. Managements in shipping offices, shipyards, engine shops and factories have a duty to their country. While avoiding party politics, they should not hesitate to state facts, as one firm, R. A. Lister & Co., Ltd., has been doing in The Shipping World for some months past. There has been no suggestion of party bias but simply reminders of the way in which costs have increased and taxation has mounted up, with the inevitable result that we are experiencing all the penalties of inflation. Nationalisation has been tried and has failed. Now it must be the turn of the business men to save us from the accumulated burden of six years' experimentation by political busybodies without knowledge of the mainspring of industry and particularly of the maritime industries. We must become once more a nation of adventurers or we cannot survive. That means men of courage and enterprise must regain their freedom, in order to do their best for themselves and thus confer benefits upon their fellows. Every successful shipowner, shipbuilder and marine engineer has willy nilly promoted the welfare of the country as a whole, attracting the savings of thrifty people, willing to face the risk of failure, by investing their capital in various ways so as to increase employment, and contributing to the Exchequer vast sums year by year.

The coming General Election must be a fight for freedom for industry. If the fight is lost, then our condition will go from bad to worse. We must work harder and save more if we are to obtain the bare necessities of life. As islanders, we must have as an essential factor in our efforts the best ships that can be provided by the most efficient shipyards at prices which will enable them to trade at a profit in face of the competition that will develop, now that our enemies of yesterday, with lower standards of living than ours, are being freed from the restraints which were imposed on them at the close of the war. We won the war, but whether we can win the peace, will depend on the result of the coming fight for national efficiency from the top to the bottom.

Current Events

Steel—Cautious Opinions

First and last, the maritime industries depend on steel, and for that reason the repeal of the Iron and Steel Nationalisation Act would be welcomed. Such a reversal of policy cannot, however, occur for several months, even if the Socialist sponsors of the new State Corporations are defeated at the polls. In the meantime, what steel supplies will be available? *The Economist* has been examining the matter and in the course of a long article gives facts and figures which, in its view, support "some cautious optimist, about prospects for 1953-54 or certainly later—but considerable reserve about 1952." Solutions to the problem, it declares, are easier to canvass than to apply. Our contemporary recalls that more home ore is already being produced; output is already up to about 15 million tons a year, of which 14.3 million tons will be consumed in 1951. Next year the home ore industry is being asked for 16 million tons, and, given a modest increase in labour, this, it is suggested, should be

achieved. But it is conceded there are economic and physical limits to the feeding of more and more blast furnaces with home ore, if only in transport. It adds:

Moreover, with home ore averaging 30 per cent iron content against 55 per cent in imported ores, substitution of home ore will certainly keep furnaces working, but it will decrease their effective capacity. More blast furnaces—fortunately to a considerable extent sited and designed for home ore—will be coming in this winter and next year, and will promote a better balance in the industry as German scrap imports decline.

But every ton of iron smelted from home ore needs 4 cwt. more coke than a ton of imported ore; and coke supplies might very possibly hold up pig-iron output.

With the new capacity coming in next year, the industry, it is stated, could, indeed, use more than 10 million tons of imported ore in addition to the larger consumption of home ore. British pig iron capacity for 1952 will be 11 million tons a year, which at the expected scrap level would make possible the production of 16.5 million tons of steel, from a steel capacity that by the end of 1952 will probably reach over 17 million tons a year. But that would require abundant ore supplies. If, in fact, the industry obtains as much imported ore next year as it does this, it will probably have done well. That is the final verdict of our contemporary.

Difficulties Ahead

The only thing certain about ore supplies and steel output in 1952, therefore, is, it is added, that they are going to be difficult, as Mr. Gaitskell's negotiations in Washington have already advertised. " If steel production is even to be maintained at the 1951 level, a pig iron output of at least 10.6 million tons will be necessary. This could be achieved with 9.75 million tons of imported ore and 15 million tons of home ore; since this imported ore figure would be 400,000 tons more than the industry could purchase for 1951 and 1,150,000 tons more than it is likely to ship, home ore output is being raised to provide a margin." The British Iron & Steel Federation records in its current *Statistical Bulletin* that the outlook for raw materials is " somewhat obscure." It has stated that whether the requisite tonnage can be bought and shipped to this country will depend largely on factors outside the industry's control. Above all else, it will depend on the provision of sufficient coal both to avoid the shipping shortage of last winter and to keep the country's traditional export markets adequately supplied. *The Economist* concludes that " if only because the coal and the shipping are not to be had this winter, the Federation's hope that coal imports will not interrupt its ore imports may be fulfilled. But if steel output depends to any considerable extent upon British coal exports, the outlook will be not obscure, but gloomy."

The Greedy Chancellor

A noteworthy example of the gross injustice under which " risk " investors are suffering owing to the financial policy of the Government is furnished by the latest accounts of Wm. Doxford & Sons, Ltd. Like other shipbuilding firms in varying degree, this company passed through difficult times after the First World War. The industry is more than most subject to slumps and booms and, in spite of ideological theories, we fear that such violent movements are inevitable. For a good many years past, the trading profits of Doxford's have been rising and further progress was made in the last financial year when the profits were £648,000 as compared with £529,200. What advantage will the shareholders gain as reward for the risk they took in backing up the management in the dark days? While taxation amounts to £305,000, with £28,000 assigned to the tax equalisation account, the ordinary dividend will cost only £55,125. This illustrates the extent of the injustice to risk capital, which is the very foundation on which commercial adventure is based. If the risk proves to have been a bad one, the shareholders lose their money, but if a good one, the tax collector steps in and takes heavy toll. The shareholders are treated as greedy capitalists who deserve no reward for their courage. Their modest return is described as " unearned income." In the case of Doxford's, Dr. Edward Andreae and his colleagues can do no more than recommend a final dividend of 12½ per cent, less tax, on the ordinary shares, making 17½ per cent on £600,000 in respect of the year ended June 30. Shareholders are told that this is the maximum permissible in view of the Government's declared intention to control dividends. In the previous year there was a 10 per cent final dividend and 5 per cent bonus to make a 20 per cent total on ordinary capital of £550,000, which was also paid on £500,000 for 1948-49. A share bonus of £50,000 is proposed for the third year in succession, representing one new £1 ordinary share free in respect of every 12 shares held. This is a sad story of blindness on the part of the greedy Chancellor of the Exchequer. It is in line, of course, with Socialism, which aims at discouraging private enterprise so as to make way for nationalisation, including shipping and shipbuilding. These theorists still persist in their folly, leaving private industry, for the time being, to support the losing nationalised industries.

The Australian Port Problem

Judged by prewar standards, the turnround of shipping in Australian ports is about three times as long; but turnround just before the war had already greatly deteriorated since the days before the economic depression. One of the results of that depression, in fact, was the tendency to spread work, both as to time and as to the numbers employed. To the depression, too, may be credited the urge for full employment, which has its disadvantages as well as its merits. The Australian Government has now invited Mr. C. Basten, who had considerable experience in Calcutta before he successfully reorganised the port of Singapore, to advise what should be done to accelerate turnround in Australian ports. Commenting on the problem, the latest issue of the *Monthly Trade and Shipping Review*, published by Birt & Co. (Pty.), Ltd., of Sydney, considers that the first and most obvious fault of Australian ports is that there are not enough of them. The second most obvious deficiency is labour. " There are not enough wharfies to do the work, and the number apparently shows a constant shrinkage because, for example, in Sydney, 25 to 50 wharfies are quitting the occupation each week." They claim that there are too many stoppages to make the work worth while. Critics will argue that the majority of stoppages are caused by union action, and the number of protest and " stop work " meetings is certainly considerable. The fundamental difficulty, it is suggested, is that most Australian ports, like Topsy, just grew up. " There was no design about them. Indeed, there could not have been. A serious effort to straighten out their tangles, so to introduce much-needed improvements is worth while. The efficiency of a port reflects so largely on the comfort and convenience of the people who live round it, and who are served by it and who serve it."

Interior Design of Ships

The theme of the 1951 Design Congress, held at the Royal College of Art, in London, was " design policy in industry as a responsibility of high-level management," and a distinguished contribution came in the form of a paper by Sir Colin Anderson, director of Anderson, Green & Co., Ltd., managers of the Orient Line. Some years before the war, it will be recalled, interior decoration of the *Orion* caused something of a sensation. Sir Colin in his paper related how in 1932 he undertook full responsibility for the interior of this pioneer in ship decoration, after his senior partners had agreed to a departure from the then almost universal practice of using a pseudo-" period " formula. His first task was to find an architect and designer who had no preconceived ideas, and he was fortunate in the

choice of Mr. Brian O'Rorke, who is still associated with the interior design of Orient liners. The limitations imposed by the essential structure of the ship presented formidable problems, and it soon became plain that "almost none of the thousands of utensils and furnishings that would have automatically been ordered for the old kind of interior would look right in the new." They were faced not with the mere designing of an architectural setting, but with its complete equipment, and Sir Colin pointed out the range included such things as door handles, cupboards, windows, furniture, curtains, linen, bathmats, deck chairs, cutlery and even uniforms. As he pointed out, a design policy cannot successfully be undertaken by half measures.

Continuity of Design

In the discussion following the paper a questioner wanted to know how continuity of design policy was ensured in the event of frequent changes of management, and whether steps were taken to keep in touch with the makers of equipment with a view to stimulating them to produce the types needed for the designer's particular purpose. Mr. F. I. Geddes, replying for Sir Colin Anderson, said that so far as the Orient Line was concerned, Sir Colin chose himself, and as he was still a young man there was likely to be some degree of continuity for some time to come. Contact with the manufacturers of equipment, he said, was established at an early stage in ship construction, which is a long job and gives the designer plenty of time to experiment in cooperation with the suppliers. This is a point which stresses the importance of manufacturers keeping permanently in touch with the latest trends of ship design and of shipowners and designers being alert to the latest developments in the manufacture of equipment and furnishings and the application of materials for ships. Considerable technical advances have been made in these directions since the war, as readers of The Shipping World are constantly reminded.

International Insurance Affairs

At the recent conference of the International Marine Insurance Union at St. Moritz it was announced that the Union had been promoted from category C to category B of the Economic and Social Council of the United Nations. That is some measure of the growing importance of the Union under its postwar constitution. No doubt this promotion was due in large measure to the part the Union is taking in the campaign against nationalism in insurance. Indeed, one of the outstanding features of the St. Moritz Conference was a paper on discrimination on national lines, read by Mr. J. T. Byrne, of New York, who, it may be recalled, represented the International Chamber of Commerce when discriminatory insurance laws were discussed by the Economic and Social Council at New York earlier this year. Mr. Byrne's suggestion that active committees should be formed to fight discriminatory laws will, no doubt, be taken up by the major marine insurance markets of the world. One activity in which such committees could partake would be the urging of Governments to include in commercial treaties clauses giving each party "most favoured nation" treatment. It was important said Mr. Byrne that in such treaties "insurance" should be specially mentioned, as experience had proved that the general terms of treaties were not always accepted as including insurance.

The Joint Hull Understanding

Another feature of the conference was the explanation of the Joint Hull Understanding by Mr. A. B. Stewart, chairman of the Joint Hull Committee. Mr. Stewart spoke of the three main factors which influenced the Understanding. They were the increase or decrease of perils; the claims records of various fleets; and economic factors such as rising costs, inflation and so on. The "all round" increase of 10 per cent of the revised understanding of last February was an endeavour to deal with this last factor. Mr. Stewart maintained that this modest increase was fully justified and pointed out that it operated less severely in the case of fleets with good records than in the case with those which had bad records. Nothing very new transpired in the report of the Union's Cargo Loss Prevention Committee, which, however, is doing admirable work in its particular sphere. Much good work in the matters which are the Union's particular province was also done at St. Moritz, and the Union may look forward to another successful conference in 1952, the venue of which will be in Belgium.

International Cooperation

An interesting expedition made by a small party last week in the new French train ferry *St. Germain* demonstrated the value of international cooperation in the technical marine field. The *St. Germain*, which has already been fully described in The Shipping World, is a fine example of a special type of ship, built in the Elsinore shipyard, Denmark, which has made a special study of train ferry construction. Her design and construction was the subject of close study and cooperation between her Danish builders, her French owners, and Bureau Veritas, the French classification society. In fact, the *St. Germain* is the first vessel to receive the new marks issued by Bureau Veritas for fire protection, subdivision and stability. Finally, a number of British sub-contractors played their part in supplying equipment, not least important of which in her special conditions of service is the Hastie steering gear, whose qualities were amply demonstrated during the Channel crossing and in Dover and Dunkirk harbours to the British visitors. The party was welcomed at Dover by representatives of the French State Railways, the shipbuilders, Bureau Veritas, and the Association Technique Maritime et Aeronautique, and at Dunkirk was greeted by M. Lucien Lefol, president of the Chantiers de France, who conducted the party round the Dunkirk shipyard. A tour of inspection was made of the passenger liner *Flandres* on the stocks, designed for the West Indian service of the French Line and due to be launched on October 31. It was immediately apparent that this is no ordinary vessel, with her bulbous bow, similar to that of the *Bremen* and *Europa*, and her Carlotti-type stern. The shipyard, too, is undergoing complete modernisation, with new welding and plating shops, and one of the berths is being enlarged to accommodate vessels of up to 100 feet beam and equipped with cranes of greater handling capacity, capable of dealing with large prefabricated sections.

SAYINGS OF THE WEEK

THE FUTURE OF SHIPPING

"Eventually everything big will be nationalised."—*Mr. Emanuel Shinwell*, M.P.

IMPRUDENT TAXATION

"With income tax and profits tax at today's new high levels it becomes increasingly difficult for any company to make prudent provisions for reserves."—*Mr. Henry Barraclough*, chairman of the Prince of Wales Dry Dock Co., Ltd.

SAVING 20,000,000 TONS OF COAL

"We talk grandly of harnessing the tides of the Severn at a cost of £100 million, but half that sum would modernise enough house and factory grates to save 20 million tons of coal a year."—*Dr. J. Bronowski*, Director of Central Research for the National Coal Board.

THE FOUNDATIONS OF BRITISH PROSPERITY

"Life for Britain in the coming years will be hard. I expect no reduction of income tax or surtax, and no spectacular fall in prices. Britain is the most artificial society in the world—a society of 50 million in an island made to support 10 million. This society, like an inverted pyramid, has been created by banking, trade, industrial enterprise, and investment abroad."—*Mr. Harold Macmillan*, M.P.

ON THE "BALTIC"

THE MOVEMENT OF GRAIN

By BALTRADER

North America has for some time carried the freight market on its shoulders as far as the movement of grain is concerned. Fine harvests in Canada and the United States have provided a surplus for which there is a good market in Europe. India is also importing North American grain on a big scale, but this is much less apparent on the London market than last year, on account of the large number of American vessels released from the reserve fleet and allocated for this service. If it were not for the action of the American authorities in bringing out many more laid-up ships, the present level of freights would have been raised to an exaggerated extent. Even so, the rate of 22s. 6d. per quarter for wheat from the St. Lawrence to the United Kingdom, which has recently been paid, is as high as was ever obtainable. Charterers have to pay 120s. per ton for coal from Wales to the Plate in order to ensure for owners a good round voyage in spite of poor homeward prospects; three years ago 25s. was regularly accepted for coal from Wales to Buenos Aires. The Ministry of Food is not finding it easy to obtain tonnage for transport of its purchase of 1,000,000 tons of grain from South Russia. Several ships have been secured for the first cargoes, but at 100s., or 7s. 6d. more than was last paid. The Mediterranean area is short of tonnage and rates are going up; an advance of 7s. 6d. per ton (90s.) was conceded last week for maize from Yugoslavia to the United Kingdom.

Lack of Grain from Southern Hemisphere

The grain exporting countries of the Southern Hemisphere have lately played little part in providing homeward employment for tramp vessels. Nothing came of the hoped for revival of chartering from the Argentine in the summer, as the maize crop did not much exceed internal requirements. The Australian season for the shipment of grain which began last December had not sufficient momentum to carry through until the next season, due to open at the year's end. We may then expect a renewal of demand for grain ships in that quarter, as crops are shaping favourably, at any rate in the western and southern States; but the Queensland sugar prospects for next year have not a very favourable aspect on account of damage to the crop by drought. The Far Eastern market is another which has for some time inclined to languish; comparatively few vessels have been chartered lately for soya beans or cereals from North China. The result is that business has been done at 155s. on the basis of discharge at Antwerp or Rotterdam, compared with 200s. paid a few months ago. When cargoes are in full spate from Dairen and North China ports, shipping is benefited by the absorption of large numbers of vessels on the long run to Europe. This trade has greatly expanded in postwar years, since Japan and Manchuria ceased to be mutually supporting under Japanese rule. Nowadays Japan imports soya beans from the Gulf of Mexico and other North American sources.

Australian Time Charter Rates

It has happened at times in recent years that all the best freights were to be found east of Suez. Owners were then prepared to accept what might prove to be a loss in working their tonnage eastward. Now they will not look at employment in that direction from this side unless it shows a large return in order to compensate for possible difficulty to follow. This is certainly the experience of the liner companies and motor manufacturers who charter vessels respectively on time charter and lumpsum for voyage basis to Australia. Whereas the freight index has shown a general decline in rates between May and August, time charter rates for a trip to Australia were about 7s. 6d. per ton higher in August than in May, and have since shown a firming tendency. Thus, lower rates for loading in the East and Australia have contributed materially to the fall of the general freight index, but have helped to minimise the average decline for tonnage in home ports.

It is expected that conditions will improve before long in South Africa, where the export of coal has been so rudely interrupted by the failure of the railways to cope with both internal and export commitments. Inquiry has already increased for shipment of Calcutta coal and much tonnage (mostly Japanese) has been chartered for coal from Calcutta to Japan. A beginning has been made in chartering to the United Kingdom from Calcutta; rates from there to Australia at 142s. 6d. are about 32s. 6d. per ton higher than about a month ago.

The Freight Market

Inquiry has continued on a satisfactory scale for tonnage to bring coal and grain from North America to Europe. A vessel has been chartered for coal from Hampton Roads to Rotterdam at 82s. per ton, October. *Etrusco* and *Marine Fortune*, both October, are fixed from Hampton Roads at $10.50 to Antwerp or Rotterdam, or $10.95 to Hamburg, on "Warshipvoy" terms with 1 per cent commission. Tonnage is well held for grain, at any rate for freight in sterling, although a small reduction at $12.25 has been accepted from St. Lawrence to Antwerp or Rotterdam for spot loading. A number of vessels have been taken for grain from the Black Sea to the United Kingdom at 100s. per ton with option of Antwerp-Hamburg range at 2s. 6d. less for October, November and December loading. The Mediterranean market is firmer and 58s. has been paid for a 5,300 tonner from Almeria or Melilla (Rif.) to East Coast U.K., November. The Australian market is weak and there is little quoting from the Far East; fortunately for owners the North Pacific has been able to fill the gap. Fixtures from these include: *Cragmoor*, 8,400 tons, 147s. 6d., grain to U.K., December, or 146s. 3d. if January. She will go in ballast from Australia. The *Charles L. D.* is similarly fixed at 147s. 6d., December, and *Trevean* at 146s. 3d., December/January. Lumber and generals are workable from North Pacific to U.K. at 170s. The *Sea Comet* is fixed for grain from North Pacific to West Italy at $19, October. Time charter inquiry is good and rates steady. The *Indore*, 10,245 tons d.w., 483,000 ft. bale, 9½/10 knots on 25 tons oil, is chartered for a trip out to Malaya, delivery Cardiff, at 57s. 6d. per month, October 10/20. The *Montevideo* (m.v.), 8,330 tons d.w., 450,000 bale, 11 knots on 11 tons, will make the trip out to Australia via Sweden at 65s. per month, delivery Rotterdam November 10/30.

Air Charter Business

Although the summer holiday traffic by air is almost at an end there is good inquiry for charter planes. Much of the demand is unsatisfied on account of Government call upon available aircraft and the shortage of fuel oil on the Eastern routes. Such supplies as are available are for the most part reserved for the regular airlines. India is, however, importing stocks from sources alternative to Abadan and the fuel position is expected to improve for chartered as well as scheduled planes. Meanwhile, freight is accumulating in great quantity, awaiting air transport from Europe to the Far East.

INSTITUTE OF MARINE ENGINEERS

PRESIDENTIAL ADDRESS BY DR. S. F. DOREY

MARINE ENGINEERING as a branch of mechanical engineering is about 150 years old. During this period, however, enormous progress has been made in the general field of science, and it will be my endeavour to indicate the influence that the continuous development of science has had on marine propulsion, and the effect science may well have not only in regard to the type of propelling units of the future but also on the education, training and responsibilities of marine engineers. Marine engineering owes its origin largely to the inventive genius of James Watt, who patented the double acting engine which made it possible to adapt the steam engine satisfactorily for propelling a ship.

In the James Watt Anniversary Lecture given in 1950, which dealt with the aims and achievements of marine engineers, I showed that by the year 1850 propulsion of ships by means of steam engines driving paddles or a screw had become a reliable proposition. Since it was not until 1801 that the first steam engine was used to drive any ship, it is evident that to have been able to increase the power of marine engines from under 10 to over 2,000 h.p. during a period of 50 years was a considerable achievement. This progress, however, may be claimed to have been caused more directly by the inventive genius of a few engineers of that period rather than the application of science to effect these changes. Improvements in materials and workmanship did, however, play some part in giving confidence that steam engines were reliable for the propulsion of ships, and this implied that the type of boilers employed for the steam pressures in use in 1850, of about 25 lb. per sq. in., were also reasonably satisfactory, although no rules were in existence for their safe working pressure other than that they had to have a factor of safety of 6. But since the increase of size of machinery was largely due to the improved art of the millwright and the mechanic, and the advances in science were largely physical, the marine engineer for many years—and indeed not so many years ago—generally looked askance at science and preferred to work to empirical rules which he had himself determined by the hard road of experience.

Science of Thermodynamics

It was Joule's experiments on the mechanical equivalent of heat, published in 1843 but not generally accepted until 1847, that gave a definite lead to the science of thermodynamics. The significance of the foundation of the science of thermodynamics was to indicate that greater efficiency could be obtained by using higher initial temperatures, that is, cylinder pressures, with expanding steam and low condenser temperature and pressure. Once understood by the engineer there followed an increase in boiler pressures from 25 to 60 lb. per sq. in., which was as much as boilers of that day could withstand safely, although giving some trouble with furnaces which led to the appearance of the cylindrical or Scotch boiler.

It is proper to mention at this stage that at the commencement of the 19th century a limited form of technical education was available, the earliest being the lectures given by Professor Anderson to mechanics at Glasgow, and many mechanics institutions were established over a hundred years ago. In 1837 the Admiralty laid down proper training for engineers for the Navy, and in 1843 Dockyard Schools were opened for the technical training of apprentices. About the same time engineering professorships were established at University College, London, and at Dublin and Glasgow, Rankine being appointed Professor of Civil Engineering at Glasgow University in 1855. In 1849 the Admiralty required a steam engineer to pass an examination at the Royal Naval College, the subjects being geometry, dynamics, heat and combustion, and the principles of engines and boilers. It was in 1862 that an Act of Parliament was passed laying down the conditions for and empowering the Board of Trade to grant certificates to engineers in charge of the machinery of ships in the mercantile marine. In 1847 the Institution of Mechanical Engineers was formed. Mr. R. H. Parsons in the opening sentence of the "History of the Institution of Mechanical Engineers" states that "Mechanical engineering as a profession came into being mainly as a result of the development of the rotative steam engine," and it may rightly be claimed that the engineers who built marine engines were in the forefront. Thus, while locomotives were using boiler pressures of 120 lb. per sq. in., the engines were comparatively small, whereas the engines of the *Great Britain*, the first screw propelled vessel to cross the Atlantic, which she did at 12 knots in 1845, developed no less than 2,000 h.p.

Progress between 1850 and 1890 in steam engineering was largely effected by improvements in boiler design to withstand the higher steam pressures recommended. With the use of a reliable Siemen's Martin steel having an ultimate strength of 26 to 30 tons per sq. in., it was possible to effect a reduction in scantlings of 25 per cent in the shell plates of boilers which had previously been made of iron. There followed a large increase in steam pressures, resulting in greater economy of fuel consumption, as may be seen from the following table which represented general practice in the mercantile marine at that time:—

Year	Working pressure, lb. per sq. in.	Coal consumption, lb. per i.h.p. per hr.	Piston speed, ft. per min.
1871	45-60	2-2½	350
1881	77	2	460
1891	160	1½	500-600

For Naval work steam pressures had risen to 200 lb. per sq. in. and piston speeds to 900-1,000 ft. per min.

By 1890 the triple-expansion steam engine was firmly established, the quadruple expansion engine had also been applied to the propulsion of cargo ships, Siemen's Martin steel was in general use for the construction of boilers and ships, the working pressure of cylindrical boilers had reached 160 lb. per sq. in., and forced draught, together with preheating of air supply and feed water were in use. Twin screws were becoming the practice for passenger ships, and watertube boilers—particularly the Bellville type—were being used in French ships. Oil was beginning to be used as a boiler fuel, and Akroyd Stuart had patented and introduced the heavy oil engine. While not yet available for marine service, Parsons steam turbines had been installed in some land power stations. Electricity had also been introduced into ships mainly for the purpose of illumination.

The Twentieth Century

At the start of the 20th century the steam reciprocating engine had reached its zenith. The heavy reciprocating and rotary parts of large engines developing, in some cases, over 10,000 i.h.p. per shaft, resulted in vibration difficulties, and this led to investigations into such subjects as balancing, critical speeds, vibration and stresses in rotating parts, thereby advancing the science of mechanics. Much of this also applied to the steam turbine, which was being rapidly developed for marine purposes due to its high thermodynamic efficiency, and which in turn directed research into the behaviour of steam in passing through nozzles and blading. With increase in steam pressure and temperature on the one hand, and the attainment of much higher degree of vacuum on the other due to improved condensing practice, the application of thermodynamics became of vital importance and greater attention was given to the testing and properties of materials.

There followed a period of rapid progress of the marine steam turbine, particularly in Naval ships and liners, and then a new challenge to the supremacy of steam in the application of the oil engine for propulsion purposes with its advantage in the field of fuel economy over other types of prime mover. A review of the present position in marine engineering shows that steam turbine machinery is working at 850 lb. per sq. in. pressure and 850 deg. F. temperature, with prospects of boiler pressures of 1,500 lb. per sq. in. and 950 deg. F. steam temperature.

The fact that 70 per cent of the tonnage of ships building in the world at June 30, 1951, are to be propelled by oil engines is not only an indication of their popularity due to the low fuel consumption, but a measure of their reliability. Nevertheless, there are still a number of problems to be solved to improve their efficiency and lower the maintenance costs. Better scavenging combined with high supercharging to increase rating of cylinders, improved methods of effectively cooling pistons and cylinder jackets, lubrication of liners and bearings, wear of cylinder liners, corrosion, frettage and use of new materials of construction.

What of the Future?

This short review deals with the present position, but what of the future? If not more complicated machinery is indicated, at least the problems arising will become more complex as working conditions become more arduous. Higher working temperatures can be expected for the steam turbine requiring the use of improved materials in boiler construction, particularly superheater tubes, which will become increasingly liable to corrosion attack both internally and externally. The problems will be largely metallurgical and in certain respects will be similar to those of the gas turbine, which latter for higher efficiency can only be solved by operating at more elevated temperatures associated with special cooling arrangements, and the employment of alloyed metals having improved heat resisting and creep properties. In addition to a scientific approach to the special requirements of gas turbine design, new workshop problems will arise due to the use of special materials and to the complexity of some of its component parts, calling not only for new manufacturing techniques but the highest grade of workmanship. The possibilities of the use of nuclear energy for the propulsion of ships are also under active consideration, and here only a scientific approach is possible. Obviously a solution points to the use of an uranium pile of reactor generating heat by nuclear fission, the heat being removed by a suitable fluid flowing through the pile. A variety of problems will require to be solved before an efficient propulsive unit will become possible.

Specialised Training

I have said enough to indicate the importance of science to progress in marine engineering, and it becomes increasingly apparent the effect will be that specialisation, or a lowering of standards, must inevitably arise for the majority of marine engineers. Only the ablest will be able to deal satisfactorily on a high level with a number of subjects simultaneously, and then only by means of specialised training.

A grading of technical education and training for marine engineers becomes, therefore, of increasing and urgent importance in order that the best men with a sound scientific background to their practical engineering experience may be attracted to the shipping industry, as well as those with inferior technical qualifications but possessing sound practical training. In the case of ships, classification is defined as a division of groups in order of merit, and it becomes, in my opinion, increasingly evident that a similar principle will require to be applied in the marine engineering field. The question that naturally arises is how can this be achieved? Suggestions have, from time to time, been made in papers and their discussions read before this Institute, in particular the review by Engineer-Commander Hastie Smith in 1942, where reference is made to recommendations in a report made by a special committee set up by the Council in 1937. In brief, this committee proposed three grades, namely (i) engineer officers with sound practical and technical knowledge to enable them to deal efficiently with administrative and executive and managerial functions; (ii) engineroom artificers with practical experience of their trade and experience in its application, together with engine driving and boiler minding experience to enable them to operate and maintain the plant on board; and (iii) skilled grades as electricians, plumbers, coppersmiths, boilermakers, etc., with practical knowledge necessary for exercising their craft on board ship.

It may well be that these opinions apply equally, if not more so, today. They provide incentives for those with ability, and open up opportunities for those with sound practical training who would like to go to sea but are prevented by the knowledge that they would be unable to pass, either through inability or lack of desire, the present standard of examinations for certificated engineers. While some new standard would be required for the lower grades, that for the superior grades would not need to be lowered and could indeed, for the highest grade, be broadened, and emoluments, status and accommodation made more attractive with corresponding positions ashore. For the engineroom artificer grade it may be necessary to require a third-class certificate—not a new idea, for there was a consensus of opinion in favour of a proposal of this nature as far back as 1893 in the discussion on a paper read before this Institute by Mr. S. C. Sage. These modifications would entail the formation of a really balanced coordinated scheme in the training and education of all grades of engineering personnel, a matter dealt with by a number of contributors to the discussion on the review previously mentioned, instead of the existing, somewhat haphazard, arrangements. As the future will most likely reduce the types of marine machinery only to those having an entirely rotary motion, the case for employment of more of the certificated engine driving class may well be strengthened since few seagoing engineers see the opening up of turbines, gearing and watertube boilers.

Action Necessary

With a number of the highest grade of engineers afloat it would also be possible, in addition to normal duties, for expert knowledge to be brought to bear on the behaviour of the internal working of engines and boilers, and of machinery as a whole in all kinds of weather, through the provision of the latest electronic and mechanical instruments and other apparatus. Periods ashore should also be arranged to enable these engineers to attend refresher courses dealing with the latest developments in all types of marine machinery, materials, thermodynamics and instrumentation. From this grade would be recruited the superintendent engineers, technical consultants and advisers to the shipping companies, and also some for responsible positions with marine engine builders. Whatever scheme may be adopted in the future, action is necessary in three directions, namely:—

(1) More seagoing engineers are required.
(2) More highly technically trained engineers at sea.
(3) A well-balanced education and practical training scheme for the engineer officer grade starting at about 17 years of age.

In addition there is a need for the grading of ships based on their type and the power of the machinery, in order that the manning of engine rooms can be properly related to the grading or qualifications of the engineering personnel. In regard to (3) the proper course to adopt would be the formation of a National College of Marine Engineering to provide the appropriate technical education and in association with marine engine builders, repairers, and shipping companies for practical training.

SOME COMMENTS FROM THE BRIDGE

MODERN CONDITIONS OF LIFE AT SEA

By CAPTAIN BEN

THESE random jottings are personal notes, quite open to criticism, and no endeavour has been made to turn them into a carefully arranged article.

One of the most gratifying changes in shipboard life of recent years has been the steady elimination of parasites. Shipping is largely free of bugs, and ships are much less plagued with cockroaches than formerly. There are still plenty of the latter in many galleys and pantries, but not in such masses that saloons, smoke-rooms and cabins carry the overflow. It is quite certain that they can be much reduced, if not permanently eliminated, by a constant application of insecticides following periodic fumigation. Perhaps the most important factor in this war is using the right bulkhead materials—no more T. & G. boarding which offered such fine and secure refuge. In ships where the trouble is present the desired result can best be achieved if the master makes frequent and critical rounds of inspection of galleys, pantries, and accommodation, accompanied by the departmental heads. It is an unpleasant task. The average shipmaster has no desire to disturb the privacy of individual members of his crew, and the latter are not partial to inspections, but both sides are aware of the benefits to be gained, and the master who insists on high standards of cleanliness in food handling earns the respect of all concerned.

Improvement in conditions is largely a matter of education and sensible cooperation. Obviously owners take more kindly to the idea of installing expensive furniture and new types of apparatus if it will be cared for. From time to time one reads of a new ship that the "saloon is tastefully panelled in such and such a wood." How many officers who take their meals there during the life of the ship have any knowledge of this, and how many stewards (or how few) whose duty it is to polish this wood know anything of its nature or value? But one does hear questions about it from time to time—questions to which there are no answers, for no one knows.

Information About the Ship

Arising from the foregoing there is an American custom which was much in evidence during the war, and it may be common in times of peace, too, to supply what amount to Instruction Books with new ships. In wartime their primary use was in connection with damage control. Every compartment in a ship has its number and these may be found in the plans and drawings in the book together with detailed information about fire control apparatus, ballast and bilge lines, and plans of every pipe and wire in the vessel—every conceivable bit of information a man needs to know of his own ship. These books were the property of the ship, one being issued to each deck and engineer officer, to be passed on and receipted when he moved to another vessel. This method of supplying information is incomparably more efficient than one or two blue prints in dark alleyways with no detailed explanation. It allows curiosity to be satisfied privately without application to others.

Present-day fashion in ship design produces some criticism from officers because the much curved fore-end of the bridge house makes efficient layout of cabins very difficult. One also hears of the pantry door facing the chief officer's room, and the like. Do deck or engineer officers ever have the opportunity to criticise a naval architect's drawings? On the foc's'le head and after deck, officers and men often spend long periods in unsheltered places. In many cases there appears to be no reason why the bulwark plates on the foc's'le should not be extended a little without loss to appearance or efficiency. Any arrangement by which deck service pipes and lavatories could have water always available would be of great value.

Many ships which carry grain have shifting boards which could be used sometimes to rig up a swimming bath for the use of the crew in the tropics with no damage whatever to the boards. Anyone who has seen it done will vouch for this, and for the pleasure it gives. Shipping men have conservative tendencies and it is often only this which prevents action.

There are many cases where owners and masters are not doing their part in training their apprentices and cadets. Junior officers are heard to say that they would teach if the apprentices were willing to learn. But whoever heard of boys hurrying to the schoolroom? Here also the instruction should come from above; from owner to master to officers and apprentices, that particular officers will teach navigation and seamanship to apprentices between certain stated hours daily while at sea and not in coastal waters, and that the apprentices' books will be inspected in the superintendent's office at the end of each voyage. Thus will boys learn the "why" as well as the "how." Apprentices should also be put in charge of a boat at lifeboat drill occasionally. Opportunities to gain power of command do not come the way of the younger men in the Merchant Navy soon enough or often enough. These sort of things are already done by those owners who like to encourage their apprentices to return with certificates, but there are many cases where there is a nominal training system which is rather easily allowed to lapse in the face of circumstances.

Absence from the Bridge

Is it not curious that as a junior officer a man may watch the master handling his ship entering or leaving port. Then follows a long period of his career as second and chief officer when he is never on the bridge on these occasions. And then, suddenly, he is in command and is faced with many problems of ship handling to which he has almost forgotten the answers.

Some shipowners now publish news sheets or magazines containing news of the company's fleet and personalities. It should be possible to encourage (when paper allows) both seagoing and shore staffs to contribute. Owners have been short-sighted in not doing more to explain, to portray, the whole business of fleet management to their employees. It is very important to do this now in view of present-day trends. Members of office staffs may be put more in the picture if sent round the coast in a ship and those on board learn something of the office from the contact.

It is evident how changed circumstances can produce different types of officer and engineer. Sometimes one wonders whether the present generation will ever be so competent as its predecessors or successors. Certainly many of them will have a difficult period as they attain seniority. Their careers began in the war years or soon after, when the older men were too busy to show them the way. There was a tendency, still apparent, to leave more and more cargo work to stevedoring firms, and many young officers show a minimum of interest in the day to day work of loading and discharging. There is a great gap between master or master and chief officer, and the junior officers; and in many engine rooms there appears to be a bigger gap between seniors and juniors, as shown by the scarcity of certified engineers. It is most noticeable how the mate and second engineer often seem to be carrying the whole burden while a ship is in port. This should be only a passing phase. In other respects junior officers seem to be more generally knowledgeable nowadays, possibly due to the wireless sets on board.

COAL AND OIL

SUEZ CANAL OIL SHIPMENTS

Changes in the pattern of oil trade through the Suez Canal are revealed in the figures covering traffic during the first six months of 1951. Compared with the similar period of 1950, total tanker traffic passing through the canal declined by 5.7 per cent, the total being 23,187,000 tons, of which 11,644,000 tons were loaded tankers. Northbound shipments of petroleum products declined by 645,000 tons to 21,367,000 tons. Shipments from Saudi Arabia, however, declined from 6,605,000 to 2,460,000 tons, due to the Aramco pipeline to Sidon having come into operation at the end of last year. This loss was, however, offset by an increase of some 3,000,000 tons in shipments from Kuwait to a total of 10,000,000 tons. Shipments from Persia remained almost unchanged at 6,834,000 tons, against 6,718,000 tons, while shipments from Qatar, at about a million tons, were 78 per cent up compared with the first half of last year. The principal destinations of the oil shipments were Great Britain (6,356,000 tons) and France (4,242,000 tons). Oil shipments included 15,626,000 tons of crude, 3,140,000 tons of fuel oil, 1,154,000 tons of diesel and gas oil, 82,000 tons of petrol, and 462,000 tons of lamp oil. The figures for July last also emphasise the changing trend, when compared with those for July 1950. Tankers in ballast dropped by 364,000 tons, or about 16 per cent. In the southbound direction the drop was as much as 467,000 tons, but this was offset by an abnormal figure of 18 tankers of 114,000 tons transiting the canal northbound in ballast, as a result of the Persian situation. Tankers with cargoes passing through the canal in July totalled 2,114,000 tons, a reduction of 11 per cent compared with July 1950, and this includes an abnormal transit of 12 tankers of 90,000 tons passing in the southbound direction with petroleum products for the Red Sea and Aden. Total tanker traffic in July was therefore about 4,000,000 tons, about the same as in June, but 13.5 per cent less than last year, since when the proportion of tanker traffic to the whole has dropped from 65.9 to 57.9 per cent. Deliveries from Persia were down to one-fifth of the 1950 July figure, and from Saudi Arabia less than one-half; exports from Kuwait, on the other hand, achieved a record level of 2,422,000 tons in July, a gain of 71 per cent.

Coal Exporters' Agreement

A new agreement has been reached between the Association Technique de L'Importation Charbonniere (A.T.I.C.) and the British Coal Exporters' Federation. This agreement provides that certain commercial and technical services hitherto performed by the A.T.I.C. agencies in the various shipping districts will be discharged, as from October 1, 1951, by British coal exporters, who will set up district committees. These committees will establish suitable organisations to co-ordinate on behalf of A.T.I.C.'s London headquarters the chartering and stemming of vessels, supervision of loading, inspection of cargoes and other usual exporting functions. Organisations have been set up and co-ordinators have now been appointed by these committees in Newcastle, Cardiff, Glasgow and Hull.

New Coal Staiths

Two new coal shipping staiths are to be built by the Tyne Improvement Commissioners at Whitehill Point to accommodate vessels drawing up to 30 ft. One of the staiths will be on the site of the former No. 2 staith, which was destroyed by fire in 1938. The other will be partly on the site of the present Nos. 1 and 2a staiths, which will be demolished before the work is completed. Alternative facilities will be provided for the trawlers, tugs and craft now using No. 2a staith. The new staiths will provide up-to-date facilities for the shipment of coal from the collieries in South Northumberland. Each staith will be equipped with two radial arm loaders enabling two holds of a vessel to be filled simultaneously and give quick dispatch. Wagon tipplers will be provided to enable washed small coal to be rapidly shipped. The coal will be conveyed by electric conveyor belts from hoppers under the wagon tipplers to the radial arm loaders. Additional standage sidings for wagons are also to be constructed. The cost of the work is estimated at £600,000, but the consent of the Treasury and Ministry of Transport is necessary before the work can begin.

U.K. Refinery Output

Shell's refineries in the United Kingdom are now turning out oil products at a rate of 8½ million tons a year. This was announced by Mr. C. M. Vignoles, managing director of Shell-Mex & B.P. Ltd., at the opening of one of Britain's most modern grease plants at Barton, Manchester. Not only does it firmly establish Shell as by far the largest refinery operator in the U.K., but it also spotlights the fact that its postwar refinery expansion programme is well within schedule. This programme comprises the construction, at Shell Haven, Essex, and Stanlow, Cheshire, of fully integrated modern refineries, in addition to the specialised plants which were already in operation before the war. The combined capacity of the old refineries was just over 1½ million tons a year—a figure which has been raised to 6¾ million tons a year since the first of the new units came on stream in November, 1949. Taking into account, therefore, the 1¾ million tons a year refinery at Heysham, Lancs.—the company acquired this plant from the Government in 1947—Shell's total refinery capacity in the U.K. is now 8½ million tons, an almost threefold increase in less than two years.

Shorter Notes

Oil storage tanks are to be built at Silloth by the Regent Oil Co., Ltd. The tanks will be near the docks and oil will be brought to them by coastal tankers.

The figures of total traffic passing through the South Wales ports of Cardiff, Swansea, Newport, Barry, Port Talbot, Penarth and Briton Ferry for the four weeks ended September 9, 1951, showed an increase of 311,583 tons over the corresponding period in 1950. Export tonnages were more than 60,000 tons above the comparative period in 1950, and this increase was accounted for by heavier shipments of refined oil and spirit (up about 49,000 tons) and the unusual feature of increased shipments of coal, coke and patent fuel (up about 23,000 tons), the latter being due to the comparative period coinciding with the reduction in coal exports evident towards the end of 1950.

OFFICIAL NOTICES

New Companies

S. Bishop & Co., Ltd.—Registered September 17. To carry on business of charterers, managers and owners of sea-going tramp steamers, etc. Nominal capital: £10,000 in £1 shares. Directors: Not named. Subscribers: G. K. Ireland (solicitor) and V. Hadley (clerk), 20 Copthall Avenue, London, E.C.2. [Information from *Jordan's Daily Register of New Companies*]

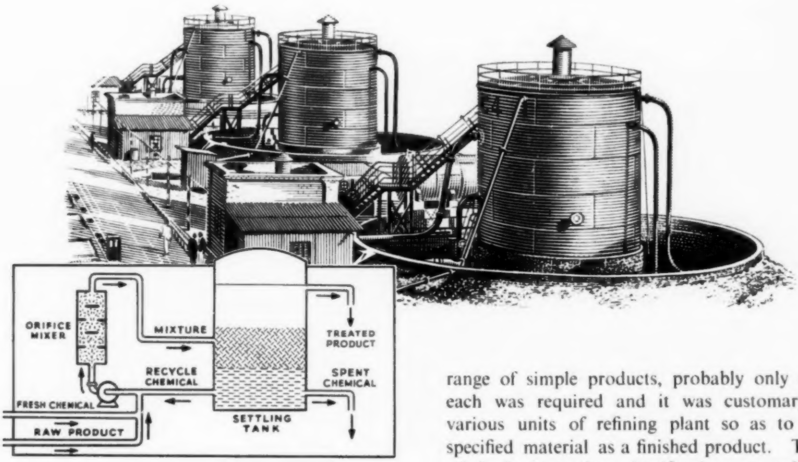
Scottish Ore Carriers, Ltd.—Private company. Registered in Edinburgh September 19. Capital £500,000 in £1 shares. Objects: To acquire shares or other interests in ships, vessels, tugs, lighters, etc. The subscribers (each with one share) are: E. H. Nobbs, 24 St. Mary Axe, London, E.C.3 (solicitor's clerk); and F. E. Roberts, 24 St. Mary Axe, London, E.C.3 (solicitor's clerk). Directors: Sir James Lithgow, Sir John M. Duncanson, Alexander H. White, Charles Connell, John C. Denholm, William L. Denholm, Leslie H. Gault, Alexander R. Glen and Victor N. Malcolm.

Increase of Capital

Blandford Shipping Co., Ltd., Bevis Marks House, London, E.C.3.—Increased by £499,900, in £1 ordinary shares, beyond the registered capital of £100.

INTERESTING FACTS ABOUT OIL

No. 6. *How is oil chemically treated and blended?*



The initial distillation process results in products which are unsuitable for the market because they contain small quantities of undesirable constituents which must be chemically removed.

Chemical refining is carried out by reagents such as caustic soda, sulphuric acid, sulphur dioxide, alkaline sodium plumbite solution, organic solvents and certain solids such as bauxite and activated clays, which have special selective properties for the removal of undesirable constituents. The products are thus improved not only in performance, but in such qualities as stability, colour, and smell which are important in their marketing.

Most chemical refining is carried out in "washeries"; plants in which the raw products are mixed and "washed" by agitation with suitable reagents. Filtration is also employed with bauxite activated clays.

No refinery would be complete today without adequate blending installations. When a refinery made a small range of simple products, probably only one grade of each was required and it was customary to operate various units of refining plant so as to produce the specified material as a finished product. Today, almost all the basic product classifications are sub-divided into different grades. For instance, a refiner may make two or three grades of motor spirit, and several grades of fuel oil. Thus, it is more convenient to operate the refining plant to produce and store a number of refined blending stocks, which may be regarded as intermediate products; they are rarely used for direct sale, but are incorporated in finished blended products. A further advantage of this system is that the refiner need not make up a finished blend until called upon to do so; thus his storage problem is simplified.

Blending operations need to be carefully controlled under strict laboratory supervision and the finished blend fully tested before being made ready for sale.

Monthly Light Alloys Section

ALUMINIUM IN SHIP STRUCTURES

REPORT ON A SEVEN-YEAR INVESTIGATION BY THE A.D.A.

The investigations described in the report form part of the long-term programme of the Aluminium Development Association for developing new applications for aluminium and aluminium alloys. The present work has been the responsibility of Mr. W. Muckle, of the Department of Naval Architecture, King's College, Newcastle-on-Tyne, and the researches here summarised have already been described, with detailed results, in a series of papers presented to the North East Coast Institution of Engineers and Shipbuilders by Mr. Muckle. The investigations have been in two parts, the first mainly theoretical and the second dealing experimentally with the determination of compression properties of aluminium alloy plates and the verification of some of the theoretical work by means of scale-model superstructures. The work is continuing, and fresh results will be issued as papers and further reports in due course. Certain economic factors of importance in determining the large-scale use of aluminium in ships are mentioned in the report, but there is no attempt to deal with all the characteristics of aluminium alloys that make them suitable for marine purposes.

THE INVESTIGATIONS covered by the A.D.A. Research Report No. 10 were started in 1943 and have been continued during the succeeding seven years. Their broad object is to fill a particular gap in the knowledge of aluminium alloys as applied to shipbuilding purposes, and so to make possible the large-scale application of aluminium alloys to ships. The applications of aluminium to marine use before 1939 were mainly small fittings on large ships and, in addition, some small craft constructed entirely of aluminium. These small craft were of the pleasure cruiser type and vessels for special service such as patrol vessels. Up to that time no large-scale applications of these materials to ships had been made, nor had the problem of the more extended use of aluminium alloys in the structures of ships been fully investigated. Before any large-scale application could be considered it was clear that theoretical and other investigations should be undertaken in view of the widely differing mechanical properties of the aluminium alloys compared with those of steel normally used in shipbuilding. The purposes of the investigation were as follows:

(*a*) To obtain a sound theoretical basis on which the scantlings of aluminium alloy superstructures and upper structural parts of ships could be determined.
(*b*) To consider attendant problems, such as temperature effects, arising in the application of aluminium alloys to ships' structures.
(*c*) To determine the weight saved by the application of aluminium alloys in varying extent and to different types of ship.
(*d*) To determine how the structural weight saved would influence the design of the ships considered, and to discover the advantages (if any) that could be derived.

Experimental Investigations

Apart from these theoretical considerations it was evident that certain problems required investigation experimentally. One problem of particular importance in this respect was that of the buckling properties of thin plating when in compression. The investigation was therefore extended to include compression tests on aluminium alloy plates. This work was carried out in such a way that the results could be compared with the existing work on steel plates, so that suitable scantlings could be determined to give adequate resistance to buckling. The applications visualised in the early stages were to superstructures of ships, and it appeared on theoretical grounds that aluminium alloy could be applied with success to a long superstructure taking part in the longitudinal strength of a ship. Consequently, it was decided to experiment on a superstructure in order to investigate stress distribution and general behaviour. Because of the obvious difficulties in making such experiments on a full-size structure the investigation was confined to a model superstructure. The model, representing a long bridge in aluminium alloy, was constructed and attached to a steel structure, the resulting composite structure being tested under load.

During the course of the investigation the choice of the most suitable aluminium alloys for shipbuilding was an important consideration. Relevant British Standard Specifications include a wide range of alloys with differing chemical compositions and mechanical properties, and a list of aluminium alloys suitable for shipbuilding, together with their mechanical properties, is given in the Appendix to Research Report No. 10. Since the investigation was started the classification societies have interested themselves in aluminium alloys, and in 1948 Lloyd's Register of Shipping produced tentative requirements for the quality and testing of aluminium alloys for shipbuilding purposes. A brief summary of these requirements is also included in the report. The investigations covered by this report lead to the following main conclusions:

1. Aluminium alloy ships' structures can be designed to have the same strength as steel structures.
2. The weight of an aluminium alloy structure is less than one-half the weight of the corresponding steel structure of the same strength.
3. This weight-saving can be effectively applied in three ways: (*a*) to increase cargo-carrying capacity, (*b*) to improve stability, or (*c*) to reduce power and fuel for a given speed.
4. The advantage gained by using aluminium alloys in a ship's structure depends largely on the type of ship being considered. The most favourable types are (*a*) those whose structural weight is a large proportion of total displacement and (*b*) those of high speed using high power.

Further conclusions arising from the experimental work are:

1. The compression experiments form a suitable basis for comparison with steel structures, and enable aluminium alloy scantlings capable of resisting buckling to be determined.
2. The experiments on the model superstructure showed that, in general, the composite structure behaved satisfactorily, but further investigation is desirable where a detached superstructure is to be incorporated in the longitudinal strength of a ship.

Further experiments on superstructures deal with the influence on the stress distribution of length, breadth and thickness of an aluminium detached superstructure. During the investigation covered by the Report other issues have arisen and are at present being actively pursued, although they are not covered by the present report. Included in these are the making and forming of large rivets, the development and testing of special types of sections for use in conjunction with plating, and a detailed theoretical and experimental study of temperature effects in composite structures.

Theoretical Investigations

Aluminium alloys can be applied in shipbuilding to: (*a*) Minor parts of little structural importance; (*b*) local strength members, and (*c*) parts of the main structure. Included in (*a*) are small deckhouses, small boat and promenade decks, navigating bridges, docking bridges and tweendeck bulkheads, as well as many minor interior fittings. In section (*b*) are hatch beams and covers, girders, pillars, etc. In (*c*) are main superstructures such as the poop bridge and forecastle, long deckhouses and the hull itself. This part of the report is concerned mainly with section (*c*) and especially with the application of aluminium alloys to superstructures of ships of various types.

The main superstructure above the strength deck amidships is regarded as being effective in contributing to the longitudinal strength of a ship if its length exceeds a certain proportion of the length of the ship. This proportion is taken by Lloyd's Register of Shipping as 15 per cent. A typical example of a main superstructure is a long bridge—that is, a superstructure extending the full breadth of the ship and whose sides are a continuation of the main side shell plating. When such a structure exceeds 15 per cent of the length of the ship it is regarded as an effective deck in resisting longitudinal bending, and the bridge deck is then regarded as the main strength deck of the ship. The scantlings of the upper and second decks in way of the bridge can be reduced. The scantlings of the bridge deck itself are so arranged that the standard of strength at this deck is not less than that at the original upper deck without the bridge. At the ends of superstructures of this type high stress concentrations are likely to arise due to the marked discontinuity in the longitudinal structure. It has been found necessary to provide additional material for the side

and deck plating in way of the ends of the superstructures in order to prevent unduly high stresses.

With regard to superstructures above the main strength deck which do not extend to the sides of the ship there are several lines of thought. These may be summarised as follows:

1. Such superstructures could be made of very light scantlings and allowed to deflect under the bending moment imposed on the ship's structure. The tops of the houses would then be relieved of the stresses which they would normally take if the ordinary bending theory applied.
2. A long deckhouse could be cut into a number of small houses by the adoption of what are called expansion joints. These expansion joints are formed by cutting the sides and the top of the house concerned and allowing the small houses so formed to "work" and thus relieve themselves of bending stress.
3. Long deckhouses should have scantlings such that the strength at the deck forming the house top is not less than that at the main strength deck. The latest rules of Lloyd's Register of Shipping give cross-sectional areas for the tops of long houses which conform with this requirement, but no reduction in the scantlings of the main hull are allowed in consequence.

This third line of thought was that adopted by Dr. J. Montgomerie in his investigations into the problem of light superstructures. He showed that the cross-sectional area of a superstructure deck should not be less than that given by the following formula in order that the stress in such a deck should not rise above the value at the strength deck without a superstructure:

$$a = \frac{I_o}{Y_o} \cdot \frac{A_o h}{A_o(Y_o + h)^2 + I_o} \qquad \text{(1)}$$

where a = cross-sectional area of the superstructure deck.
A_o = cross-sectional area of the longitudinal material of the original structure,
I_o = moment of inertia of the original structure,
Y_o = distance from neutral axis of the original structure to the strength deck, and
h = height of the superstructure deck above the strength deck.

When part of the structure of a ship consists of a material having a different value of Young's modulus from that for steel, the structure can be regarded as a composite beam. In calculating the section modulus of such a beam it is necessary to take account of this difference in Young's modulus. It can be shown that if an aluminium alloy part of the structure has a cross-sectional area a_a, then it will behave as though it were an area of steel, namely:

$$a_s = a_a \frac{E_a}{E_s} \qquad \text{(2)}$$

This area can be included in the ordinary calculation and the section modulus of the equivalent steel section is obtained. Assuming that the theory of bending holds good for the composite ship as for the steel ship, the type of stress distribution shows that, in passing from the steel portion of the structure to the aluminium alloy portion, there is a large drop in the stress due to the difference in the value of Young's modulus for the two materials. Two points arise:

1. The stress in an aluminium alloy superstructure will be low, making it unnecessary to use devices such as expansion joints to reduce the stress.
2. In going from a section in way of the superstructure to a section clear of the superstructure, the stress change in the steel portion will be less than with an all-steel structure.

These are two very important advantages of the aluminium alloy superstructure.

The report deals with the determination of the scantlings of aluminium superstructures, giving formula for two cases, one being the addition to a steel structure of a superstructure for which no credit is allowed in the longitudinal strength of the ship and the other being an aluminium alloy superstructure which is to contribute to the longitudinal strength of the ship. The resistance to buckling and the strength of superstructure sides are also considered. It is noted that where for ordinary strength relatively thin material would suffice in the decks and sides of superstructures it would be advantageous to consider longitudinal stiffening of the deck and sides. Safe stress for aluminium alloys are given. In dealing with the economic use of aluminium alloy a special type of heavy bulb section is recommended.

The methods outlined in the report for determining the scantlings of aluminium alloy parts of the structure of a ship have been applied to a number of different types of ship. The general particulars of these ships are given in tables, showing their profiles and midship sections. The general procedure adopted in the calculations was first of all to estimate the weight-saving to be expected due to the adoption of aluminium alloy for parts of the structure. In making these estimates it was assumed that various smaller items, such as small deckhouses, masts, derricks, boats, davits and tweendeck bulkheads, would themselves be constructed of aluminium. Having obtained these weight estimates, possible modifications to the dimensions and form were considered, taking into account the reduction in the height of the centre of gravity due to the reduced top weight. Estimates of power for the ships with these modified dimensions were compared with estimates of power for the original ships. From these comparisons it was possible to obtain the percentage reduction in power obtainable. In one or two cases the effect on the deadweight carrying capacity of the ships was also determined, assuming that no modifications to the dimensions were made and the weight saved was used as additional cargo deadweight. The results of these calculations are shown in the report. It is clear that not all the ships investigated showed to the same advantage, the most suitable types being those of high power and hence high fuel consumption, and those whose structural weight is large in relation to the load displacement. The following comments are confined to the more significant ships.

Ships E and I.—Both these ships are of the cross-Channel type, being of high speed/length ratio and low deadweight in relation to displacement. In carrying out the calculations for the ship E two alternative arrangements were considered. In the first case aluminium was used only for those parts of the structure above the shelter deck (which is the strength deck), while in the second case the aluminium alloy structure was carried down to the second deck. The technical particulars for these two alternative arrangements show that the power could be reduced by 5 per cent with the first arrangement, and by 7 per cent with the second arrangement. In the case of ship I one arrangement only has been considered, viz. with all the structure above D deck constructed of aluminium. In this ship C deck is the strength deck. The results are very much the same as in ship E, the reduction in power being about 8 per cent.

Application in Atlantic Passenger Liners

Ship F.—This ship, which is one of the large Atlantic passenger liners, was investigated to ascertain the extent to which large-scale applications of aluminium to the larger ships could be made. The strength deck is the promenade deck, and in applying aluminium to the structure not only have the superstructures above the strength deck been made of aluminium alloy but also the promenade deck and the deck next below. Increases of scantling on the two uppermost steel decks in the composite structure were found necessary and also some increases in bottom scantlings. Even in such a large-scale project as this the stress in the aluminium alloy is only about 4.6 tons/in.^{2}, which is about 0.5 of the maximum steel stress in the original ship. A conservative estimate of the allowable stress for the aluminium alloys being considered would be about 0.58 of the steel stress, so that with the arrangement adopted there is a reasonable margin. The greatest stresses in the steel parts of the composite structure do not exceed the greatest stresses in the original structure. The amount of weight saved in the composite ship is large when all savings are taken into account; that is, the reduced structural weight due to reduced beam, and the reduction in fuel and machinery weight made possible by the reduced power, as well as the initial weight-saving due to the replacement of part of the structure by aluminium. The total reduction in displacement represents over 6.5 per cent, and comparative estimates of power show that, with the decrease in beam possible to give the same metacentric height, and the smaller block coefficient to give the reduced displacement, the reduction in power is about 10 per cent. It is worthy of note that part of the upper structure of this ship which was considered to be replaced by aluminium alloy was of high elastic limit steel—which would tend to reduce to some extent the price differential between the two materials. This example is interesting in showing that even in the largest ships it is possible to design a composite structure with strength equivalent to that of an all-steel structure, assuming that the problem of attachment can be satisfactorily solved and that the large thicknesses of aluminium alloy plates which would be necessary can be supplied. The saving in power achieved would appear to be of considerable economic importance.

Ship K.—This is a passenger and cargo ship of quite moderate dimensions but of fairly high speed. As in the previous two ships, the use of aluminium alloy has been

extended down to the main hull structure, the two uppermost strength decks being made of aluminium alloy. The stress in the aluminium alloy portion of the structure is just over 4 tons/in.^{2}. The same procedure was adopted as in the other examples, i.e. reducing beam and displacement while maintaining the same metacentric height. The possible power reduction consequent on these modifications in this case is about 12 per cent.

Temperature Effects in Composite Structures

The coefficient of linear expansion for aluminium alloys is much greater than that for steel; consequently, with a rise of temperature in a structure consisting of the two materials the alloy portion is put in a state of compression. The effect on the structure is as follows:

1. Due to the restraint exercised by the attachment of the aluminium alloy portion to the steel portion, direct compressive stresses arise in the alloy and direct tensile stresses arise in the steel.
2. The forces acting on each portion of the structure are the same, but their lines of action are different. A couple is thereby created which causes the ship to hog, thus relieving some of the compressive stress in the aluminium alloy deck.

A method of calculating these stresses has been worked out for two conditions:

1. When there is a uniform temperature rise over the whole structure.
2. When there is a temperature rise which increases linearly from the keel to the uppermost deck, i.e. a linear temperature gradient.

A calculation has been made for vessel H for the two conditions quoted above. This example shows that temperature stresses may be of importance in composite structures, and that for the same temperature on the upper surface of the structure the stress is greater when there is a temperature gradient than when there is a uniform rise of temperature. A fuller investigation of the problem of temperature stresses in composite structures has been carried out by Corlett.

Faying surfaces of aluminium and steel should be insulated from each other to prevent electrolytic action in the presence of moisture. Zinc chromate paint is effective and suitable on all grounds. Cadmium plating serves the same purpose on steel bolts. The calculations shown in this report have indicated that over 50 per cent of the weight of a steel part of the structure can be saved by the use of medium-strength aluminium alloys. The designer has to consider how this weight-saving can best be applied, and clearly this will depend largely upon the type of ship.

In the purely cargo ship of comparatively low speed it is clear that the weight saved can best be utilised as additional cargo deadweight. In employing the weight-saving in this way there would be no modification of dimensions of an all-steel design. The ship would be able to carry a larger amount of cargo on the same draught. It follows, however, that there must be sufficient space on board to accommodate the additional cargo, otherwise some modifications of dimensions would be necessary. In ships which are not loaded down to their marks when all available spaces are full there would be no advantage to be gained from the point of view of increased cargo deadweight.

Weight-Saving Properties

In ships of the cargo and passenger type and ships of the purely passenger type the advantage of the weight-saving may be summarised as follows: The reduction of top weight by the use of aluminium alloys for superstructures, etc., reduces the height of the centre of gravity above base, and this in turn improves the initial stability of the ship. It is thus possible to reduce the breadth of the ship in order to maintain the same stability as with an all-steel vessel. The reduced breadth provides some further reduction in structural weight, and the effect of this and the initial weight-saving is to reduce the total displacement of the ship. Reduced displacement means less power for a given speed, resulting in a reduction in the weight of machinery and fuel with a consequent further reduction of displacement. The benefit gained in this process is reduced fuel consumption. This, of course, would apply to all types of vessel, but it will apply with more force to certain types. Thus the greatest amount of power will be saved in ships whose structural weight represents a large portion of the displacement, and in ships where the speed, and hence the power, is high. Thus, in a ship with a structural weight that is 20 per cent of the displacement, reduction in weight by 10 per cent will reduce the displacement by 2 per cent. If, on the other hand, the structural weight represented 40 per cent of the displacement, the same percentage reduction of weight would represent a reduction of 4 per cent of the displacement. The same argument will apply to power. If the power can be reduced by 5 per cent, then this represents a greater economy in fuel in a ship of 10,000 h.p. than in a ship of 5,000 h.p. A third way in which the weight saved by the use of aluminium alloys may be applied is to extend the passenger accommodation. The reduction in top weight produced by making the superstructures of aluminium alloy may permit extra superstructures to be fitted for the accommodation of more passengers.

The report shows that on theoretical grounds it is possible to design a ship's structure having aluminium superstructures which will have the same strength as a steel structure. This applies not only to the case where a detached superstructure of aluminium takes place in the longitudinal strength of the ship but also to the case where the upper structural parts of the main hull girder are made of aluminium. It presupposes, however, that the problem of attaching steel to aluminium can be carried out satisfactorily, particularly in the larger thicknesses of plating. The weight-saving which can be achieved in such composite structures represents over 50 per cent of the weight of the steel part which is being replaced by aluminium. This weight-saving can be achieved with aluminium of medium strength, viz. about 17 tons/in.^{2} ultimate tensile strength, which is the minimum required by the tentative recommendations of Lloyd's Register of Shipping. In many of the examples worked the maximum stress in the aluminium was below what may be regarded as the safe working stress of the material, even on the most conservative estimates. It would appear, therefore, that from a longitudinal strength point of view medium-strength alloys are adequate for the longitudinal material of superstructures and upper structural parts. In many cases the weight saved is of sufficient magnitude to be of economic importance. Some of the ships investigated show up more favourably than others in this respect, the types most suitable for the application of aluminium being those of high speed and power and those whose structural weight represents a considerable proportion of the displacement.

Buckling Characteristics

The compression tests on aluminium alloy plates enable a comparison to be made with steel structures from the point of view of buckling. By comparing structures in this way use is being made of the large amount of experience available with steel structures, and the method should lead to the design of suitable aluminium structures. The aluminium-5 per cent magnesium alloy in the soft condition affords suitable buckling characteristic, especially at the high values of span/thickness ratio. It is clear from the experiments, however, that the buckling properties of the non-heat-treatable alloys in the soft condition at the lower values of span/thickness can be improved by cold working. The heat-treatable alloys and the work-hardened non-heat-treatable alloys show essentially the same buckling characteristics, as in both cases buckling occurs at stresses below the elastic limit of the material. The experiments on the model superstructure show that for the size of superstructure tested the theory of bending does not correctly forecast the stress distribution in the sides and deck of the superstructure. This is due to the discontinuity at the end of the superstructure, which causes considerable stress relief at the centre of length. It would appear that the extent to which this stress relief would take place is a function of the dimensions and proportions of the superstructure. This suggests that further investigations are desirable on a series of models having different lengths, breadths and thicknesses with a view to determining the influence of dimensions on stress distribution.

A booklet issued by Richardsons, Westgarth & Co., Ltd., entitled *Power for Industry* contains an introductory story explaining the production capacity of the company for land power purposes. Details and illustrations are given of the company's products, including equipment manufactured or now on order at Hartlepool.

The North Eastern Marine group of companies has produced a brochure, *N.E.M. and Associates*, stressing the range of activities of the group's four works, which in five years have produced machinery of 600,000 horsepower for marine purposes. Illustrations include aerial photographs of the works.

A new bulletin (No. 551) dealing with centrifuges for a variety of industries has been issued by Sharples Centrifuges, Ltd.

A DRAWING by George Cruikshank is featured on the front cover of the latest *News Letter*, house magazine of the General Steam Navigation Co., Ltd. The issue, No. 61, is a tenth birthday number.

Monthly Light Alloys Section

RECENT MARINE APPLICATIONS

A REVIEW OF VARIOUS DEVELOPMENTS INCLUDING LIGHT ALLOYS IN THE UNITED STATES

By a Special Correspondent

News of the marine application of aluminium and its alloys has come from far and wide in recent months and ranges from a 40-lb. paddle boat produced in Switzerland to the use of 2,000 tons in the liner *United States*, now being completed in America. The paddle boat is only of passing interest but is a two-seater built by Aldo Galante of Geneva. A more striking design of small boat is produced by Leichtmetallbau Max Spiegel who build light-metal "Spiboats" in two sizes. These are exceptionally neat craft which go as far as to have the seats stamped to shape—reminiscent of the laboratory stool. One is a 13 ft. by 4 ft. craft and the other is 15 ft. long with a 5 ft. beam. M. Spiegel points out the following advantages:—low deadweight (smaller model 136 lb.); indefinite service life; easy cleaning; low maintenance; easy transportability; no painting; unsinkable (three buoyancy tanks are built in); cheaper than wooden equivalent; easy storage; easily repaired if damaged; coolness in high temperatures as the boat remains at the temperature of the water; oars also light alloy but unsinkable; outboard motor can be fixed.

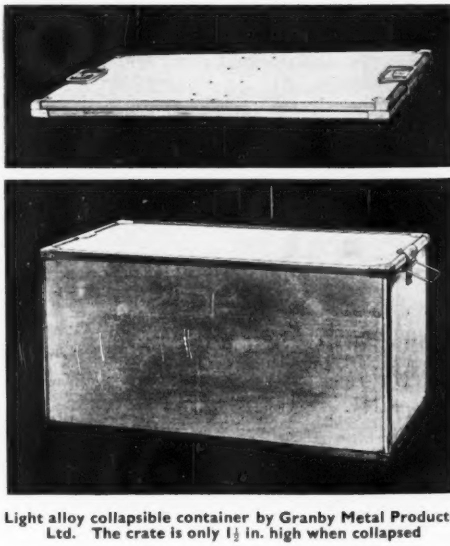
Aluminium lifeboats are no longer news, but a greater number of boat constructors are interesting themselves in the production of such craft. In Germany, Ruhrstahl A.G. of Brackwede has developed light alloy lifeboats in three sizes, 8, 10 and 14 metres in length. Apparently, this company does not restrict itself to boat building and offers aluminium gangways as well. The U.S., however, now claim the world's largest life boats. Measuring 36 feet in length and weighing three tons each, these boats are being built by the Marine Safety Equipment Corporation of Point Pleasant, N.J. Ten such boats are being built and will carry 150 passengers each. They have been ordered by American Export Lines for their new ship, the *Independence*.

As well as conducting wide scale experiments with all aluminium PT boats, as mentioned in The Shipping World of August 1, the U.S. Navy has now revealed application of the metal to submarines. The U.S. submarine *Fairwaters* has been built with highly streamlined upperworks, all in aluminium. Comprising a single structure some 20 ft. to 25 ft. in height, the aluminium shell encloses conning tower, radar equipment, air intakes and exhaust ports. U.S. submarines make normal use of aluminium for bulkheads, crew and dunnage lockers, portable deck gratings, insulated sheathing and in bunks.

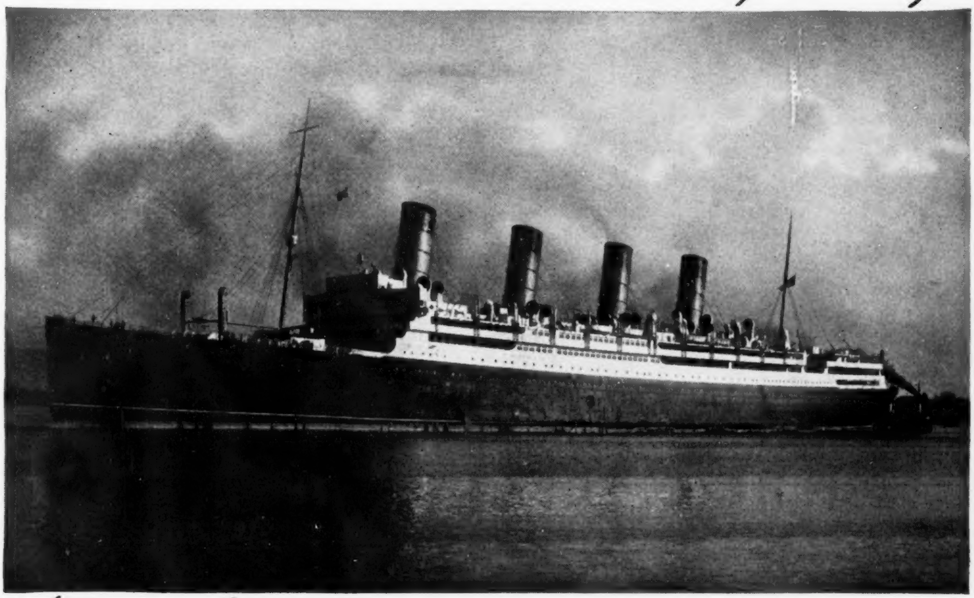
Collapsible Container

Over the past year Granby Metal Products, Ltd., of Bradford, Yorkshire, have been developing a collapsible container. Eminently suitable for all forms of transport, especially sea and air, this rectangular crate folds up into a neat and compact package only 1½ in. high. Being square ended, sides, top and bottom are the same size thus making for neat stowage in the collapsed state, as may be seen from accompanying photographs. The container is in BA21 aluminium alloy supplied by the British Aluminium Co., Ltd. This alloy contains 2¼ per cent magnesium and is thus one of the range of alloys recommended for marine use. The temper in which the metal is used is half-hard and the gauge used is normally 18 s.w.g., though this will vary according to the size of the container. The design lends itself admirably to production in almost any size. To assemble, the bottom edge of each side panel is placed in a patented groove at the base. This feature ensures that when the side panel is raised to the vertical it is locked into the base. The ends are assembled first, the vertical corners being semi-interlocking. The sides are thus prevented from being forced inward against the contents. The container can be packed or unpacked with only three sides erected and when the lid is in place the whole unit is quite solid. There are patent clips at each end of the container which can be wired, sealed or locked, thus making it pilfer-proof.

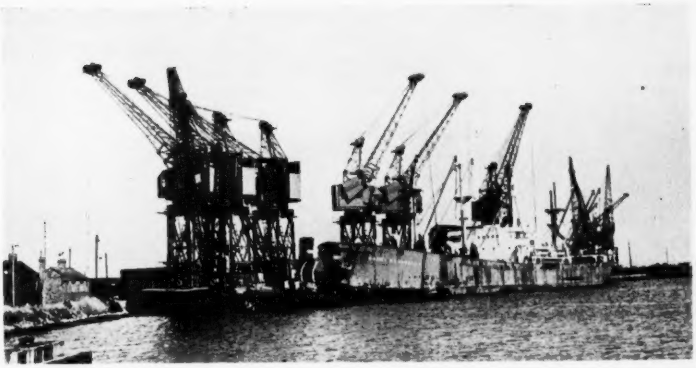
Bearing in mind the old joke concerning the American soldier crossing to Europe in the *Queen Elizabeth* during the last war who asked a British journalist why Britain could not build a ship like her, American publicity for the new liner *United States* has been awaited with some interest. The headline in the shipbuilder's own house-magazine, "Building the s.s. *United States*, World's Greatest Passenger Liner" may give rise to some criticism. Comparisons, however odious at times, are nevertheless nearly always interesting, and it should be noted that one unfair comparison would be the displacements of the *United States* and the two *Queens*. With over 2,000 tons of aluminium in the new American vessel, a saving in weight of rather more than this amount will have been effected. This saving is also in the most effective position, in the superstructure, thus reducing top-weight. This is undoubtedly the largest marine use of light alloy to date. As well as a substantial portion of the superstructure, other items in the *United States* produced in aluminium are interior bulkheads, lifeboats, davits, ladders and staircases, radar tower, ventilation ducting, doors, windows, screens, ceilings, cabin fixtures, shower enclosures and swimming pool accessories. The list even includes church altars and dog kennels. In addition to a great deal of decorative trim, over four thousand items of furniture are being supplied in aluminium by the General Fireproofing Co. This is reported to cover all staterooms and public rooms on board. The largest single light alloy features are the funnels (illustrated in The Shipping World of June 6, 1951), which do deserve the title of "world's greatest," the forward "stack" having a fore and aft length of over 60 ft. and height of 55 ft. This distinction was previously held by the *Caronia*, whose funnel is 53 ft. in length and 46 ft. high. Despite the difference in size, the *United States*' funnels are considerably lighter than that of the *Caronia*.



Light alloy collapsible container by Granby Metal Products, Ltd. The crate is only 1½ in. high when collapsed



IRON ORE FACILITIES AT NEWPORT



SIX ELECTRICALLY-OPERATED CRANES INSTALLED IN SOUTH DOCK

ADDITIONAL facilities for the rapid handling of cargoes of iron ore have recently been provided by the Docks and Inland Waterways Executive at the East Quay, South Dock, Newport, by the installation of six electrically-operated level luffing cranes of 10 tons capacity. Built by Stothert & Pitt, Ltd., the new cranes replace hydraulic cranes of three and six tons capacity, and although these cranes ran on a track of standard gauge, it was necessary to strengthen the quay to take the new units. The new back rail foundation consists of 49 reinforced concrete piles 16 in. by 16 in. placed at 10-ft. centres. A continuous reinforced concrete beam 1 ft. 6 in. wide by 3 ft. 3 in. deep is bonded to the piles and surmounted by a 1 ft. 6 in. by 9 in. concrete railbearer. Between the rails reinforced concrete paving has been provided under which are the electric supply cables. All foundation and reinforced concrete work was carried out by Christiani & Neilsen, Ltd.

The new cranes are of the four-rope type for use with level cut grabs of 43 cu. ft. capacity. They are also convertible for use as 10-ton general cargo cranes. The cranes have the following characteristics:—

Maximum radius	60 ft.
Minimum radius	20 ft.
Height of lift above rail level	60 ft.
Depth of lower below rail level	40 ft.
Centres of track rails	13 ft. 6 in.
Centres of bogies	17 ft.
Clearance under revolving superstructure	45 ft.
Tail radius	14 ft. 6 in.
Weight of crane unloaded (approx.)	155 tons
Maximum corner load (full load in 5 lb./sq. ft. wind) ...	62 tons
Maximum corner load (no load : 25 lb./sq. ft. wind) ...	75 tons
Stability factor (full load in 5 lb./sq. ft. wind : jib across track)	2.3

The hoisting speed of the cranes is 10 tons at 150 f.p.m., with two motors each of 75 b.h.p. in use, while slewing with one 15-b.h.p. motor is carried out with the same weight at 1 r.p.m. The maximum speed of luffing is 10 tons at 200 f.p.m. with one motor of 20 b.h.p. Using two 10-b.h.p. motors, travelling is at 40 f.p.m. with 10 tons. The cranes are fitted with the Toplis type level luffing gear and are also equipped with an electrically-operated overload indicator mechanism. They are also connected to duplicate cable services, so that in the event of a fault on one service a supply is available throughout the length of the quay from the alternative cable. To facilitate the operation of the berth, two 3-ton electrically-operated capstans have been installed and adequate floodlighting has also been provided for shift work.

The Docks & Inland Waterways Executive state that the new facilities should greatly assist in the more rapid handling of the large quantities of iron ores and other mineral ores imported through Newport, iron ore imports last year amounting to 381,022 tons, and in 1949 to 454,179 tons.

Newcastle-on-Tyne City Council is to promote a new Parliamentary Bill, one of the clauses of which will relate to the operation and administration of Newcastle Quay. Power is to be sought for the Corporation to make charges for goods and cargoes discharged overside from vessels berthed at the Quay. It is also intended to continue permanently wartime increases in rates and charges for the Quay. When the matter was discussed at a meeting of the City Council, it was stated that ships berthed at the Quay were unloading on to barges and the Corporation could not make any charge. The new Bill, if approved, will enable the Corporation to make a charge for cargoes unloaded in this way.

Proposals for Port of Colombo

The creation of a Port Trust and the development of either Trincomalee or Galle as a second port in Ceylon to ease congestion in Colombo harbour are two of the main recommendations of the Harbour Investigating Committee in its report to the Minister of Transport. The report was made by the two members of the committee, Mr. Eric Millbourn, Shipping Adviser to the British Ministry of Transport, and Mr. A. E. Christoffelsz, former chairman of the Colombo Port Commission. The committee has recommended that the proposed Port Trust should take the place of the Port Commission and should function on the lines of similar trusts in other countries. The committee referred to the importance of Trincomalee harbour from the point of view of the country's development and indicated that with the large-scale development plans for the eastern and north-western provinces, Trincomalee is of immense value. Trincomalee is at present a naval base but the committee did not see any reason why it should not serve as a second port as well. The committee's investigations lasted two weeks. Meanwhile work on the Colombo port development scheme is going on ahead of schedule.

Medical Centre in Royal Albert Dock

A new medical centre was opened last Friday by the Minister of Labour and National Service in the Royal Albert Dock, London. Four types of medical centre are being built throughout the country by the National Dock Labour Board, and the latest is the first of the full-size centres to be completed in London. A similar centre is nearing completion at West India Dock and additional centres are being planned at Victoria Dock, London Dock, Tooley Street, King George V Dock and at Tilbury. The first medical centre to be built in London, an adaption of a small building, was opened in the Surrey Dock in December 1950 and during the first six months of this year it dealt with nearly 3,000 treatments. Staffed by two sisters, the new centre is equipped to treat all accident cases other than those requiring hospital attention, which, in order to save vital time, will be taken directly to hospital by ambulance. It is estimated by the National Dock Labour Board that many valuable manhours are saved by the introduction of the medical centres. More than half of the persons treated at the centres, however, have not been under the control of the National Dock Labour Board and consisted mainly of other workers in the ports. In 1950, of the 199,740 treatments carried out, 111,413 were to other than dockers. Dock workers at the Royal Albert Dock have built a garden to the new centre, including a fishpond. The Board's plans envisage a total of 46 centres of the four master types, and with the opening of the new centre there are now 29 in operation. It is expected to have 40 working by the end of the year.

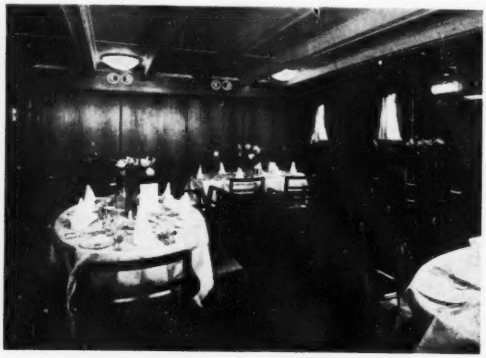
SIR RICHARD E. YEABSLEY, a partner in the London accountancy firm of Hill, Vellacott & Company, has been appointed to the board of F. Perkins, Ltd.

THE address of the Beldam Packing & Rubber Co., Ltd., is now Plantation House, Fenchurch Street, London, E.C.3. The telephone number remains unchanged (MANsion House 4771); telegrams: Veepilot, Fen, London.

FOUR SISTER SHIPS WITH "HOLOPLAST" ACCOMMODATION

The photographs show interior views of the *Astronomer*, which, with the *Wayfarer*, *Wanderer* and *Arbitrator*, has been built by William Doxford & Sons, Ltd., for the Charente Steam-Ship Co., Ltd. (Thos. & Jas. Harrison, Ltd., managers). All four ships have "Holoplast" accommodation bulkheads

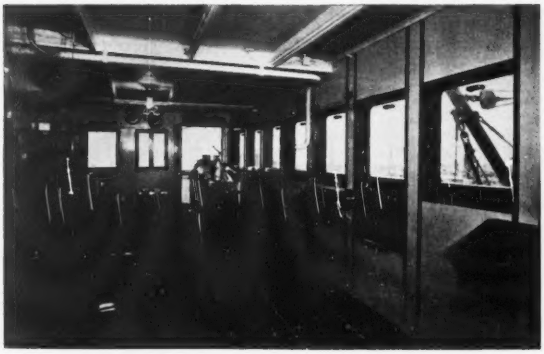
The smokeroom, with applied Dutch elm surface



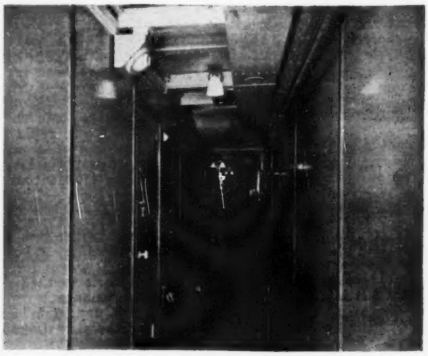
Dutch elm applied to panels in dining saloon

The owner's stateroom, with panels of applied weathered sycamore

The applied oak surface in the crew's recreation room



Pastel-green synthetic stove-enamelled panels in the wheelhouse



A passageway with panels as in wheelhouse

The "Active Rudder"

New Development by German Firm

Among the exhibits at the Engineering, Marine & Welding Exhibition was a new combined propulsive and steering system which has been developed by a German firm. This firm, Pleuger & Co., K.G., of Hamburg, has for a long time specialised in the production of submersible pumps, for salvage and other purposes, and in the course of its work has developed to a high degree the submersible electric motor. It is this type of motor that is featured in their new steering system.

The system has been given the name of "Active Rudder." Basically, it consists of a rudder in which is incorporated a propeller, driven by a submersible electric motor housed within the body of the rudder. As the rudder is turned the propeller naturally turns as well, and this both enhances the turning effect of the rudder under normal steering conditions and also makes possible manœuvres which would otherwise be quite impossible.

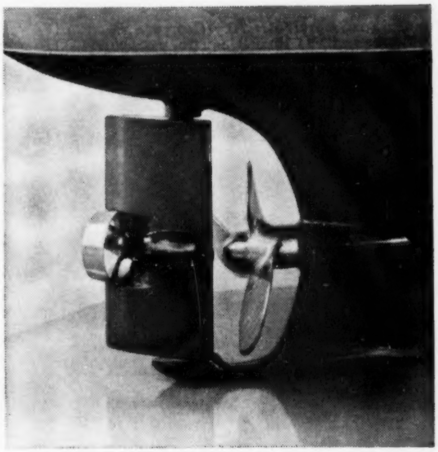
Increased Manoeuvrability

It is envisaged that the Active Rudder will be of benefit both to large and small craft. In small vessels such as harbour service craft, where manœuvrability and simplicity are of greater importance than propulsive efficiency, it may well be desirable to use one or two Active Rudders as the sole means of propulsion. For large vessels this would not be practicable, and in this case the normal propeller would be assisted by a secondary one mounted in the rudder. About nine-tenths of the total power available would then be absorbed by the main propeller, and the remaining tenth by the Active Rudder.

The advantages of the Active Rudder to the large vessel are threefold. Under normal conditions at sea, much less helm than usual is required. The resistance of the rudder to the forward motion of the ship is thus reduced, and steering, particularly when no gyropilot is being used, is made easier and more efficient. In harbour, or in rivers or canals, where the ship will be travelling at slow speed, it becomes impossible to lose steerage way. An Active Rudder should be capable of rotation through 80 deg. in either direction, and this, with the reversability of the electric motor, allows a propulsive force to be exerted on the vessel in any direction whatsoever, even when stationary. The third advantage is the additional safety provided. In the event of a breakdown of the main machinery, the rudder can be driven from an auxiliary generator and used to bring the ship to port.

Two Vessels Fitted

Two vessels have already been fitted with the Active Rudder. The first is a police launch at Hamburg, which has already been in service for a year. This craft has no main propeller, and is driven solely by two Active Rudders, each of 35 shaft horsepower. The other is an experimental vessel owned by the manufacturers. This craft, which has been converted from a motor fishing vessel, has a normal propeller transmitting 500 h.p., with two Active Rudder units,



The "Active Rudder"

situated one on either quarter, each transmitting 250 h.p. This vessel, the *Pleugerpumpe 2*, gave a number of demonstrations in the East India Dock, London, during the Marine Exhibition, and these were most impressive, despite the fact that the German skipper had not had a great deal of time previously to practice handling the unusual controls.

The Active Rudder is being fitted in two other ships, both of which are building to the order of Pleuger & Co. One is a coaster, the other a 7,000-tons deadweight cargo ship, the external design of which was recently the subject of a competition in Germany. The design of rudder proposed for this ship is illustrated. It will be seen that the housing of the motor, coming just abaft the main propeller, assists in the prevention of vortices here. The auxiliary propeller is at the after end of the rudder. In craft in which there is no main propeller, the auxiliary propellers are mounted at the forward ends of the rudder blades, to obtain cleaner water conditions.

At present the Active Rudder is available in powers only up to about 350 h.p. The motor is an A.C. motor of squirrel cage type, in which water is allowed to flow freely between rotor and stator. The thrust bearings are water-lubricated, and the stator windings are encased in a special type of plastic insulation. The necessity for a small diameter of motor means that the speed is higher than would be ideal for the propeller.

The "Pleugerpumpe 2," fitted with an "Active Rudder," describing a full turning circle

BOOK REVIEWS

Business in Great Waters, by George F. Kerr. (Faber & Faber, Ltd., 24 Russell Square, London, W.C.1. Price, 12s. 6d.)

This is the war history of the P. & O. Line, 1939-45, told with understanding and a proper sense of values. The work is authoritative, for it is obvious that the author has collected his material at first hand, from the accounts, written and spoken, of the men who participated themselves in the stirring events which are recounted in these pages with a fine narrative style. A large part of the P. & O. fleet was engaged in trooping, and the chapter which describes life on board the troopships, from the managerial as well as the military point of view, is perhaps outstanding. Throughout the book the human touch predominates, as is fitting in a book which is a tribute to the P. & O. and to the Merchant Navy as a whole. One point of style, however, will not fall agreeably to all ears—the author's omission of the definite article before the names of merchant ships, particularly such well known P. & O. ships as the *Rawalpindi*.

The Brassfoundry. (Productivity Team Report published by the Anglo-American Council on Productivity, 21 Tothill Street, London, S.W.1. Price, 7s. 6d.)

The latest in the series of productivity reports produced by the Anglo-American Council, this is certainly the longest, containing 170 illustrations and running to nearly 200 pages. It is, in fact, a substantial and comprehensive treatise on the subject, and can justly claim to be a handbook of modern practice. It is interesting to note that the team found that on the technical side the British industry is ahead of American standards, but when it comes to production the output per man-hour in the United States is higher than in British plants of similar type and size. The report analyses the reasons for this discrepancy very closely and in great detail. In addition to the valuable chapters on methods and technique, there are special chapters which deal with such matters as costing, time and motion study, incentives, and labour relations as a whole.

Lloyd's Maritime Atlas (The Corporation of Lloyd's, London. Price, 21s.)

The chief value of this atlas (approx. 9¾ in. by 7½ in.) lies in the inclusion of a much enlarged and modernised version of the old *Lloyd's List Of Ports & Shipping Places*, unobtainable for some years. While the 16 maps show the more important trade centres, this section (Section II) gives the latitude and longitude of thousands of lesser known shipping places, some of which have become increasingly important recently. Names and positions are arranged in 112 numbered columns to follow the mainland coastlines of the world (with breaks to include islands, etc.)—a system which has the additional advantage that the port's position in the column is a quick guide to its relation to other (major) ports. All ports are listed alphabetically in the index (Section III), which refers to the appropriate column. From the number of inquiries of this nature received at these offices alone, it is clear that the atlas should save much time and trouble in many branches of the shipping business.

RECENT PUBLICATIONS

The Selby shipbuilding company of Cochrane & Sons, Ltd., has produced a brochure entitled *Building Tugs for Service at Every Port*, which contains illustrations and details of tugs recently completed by the yard.

An illustrated catalogue has been produced by Oldham & Son, Ltd., of the company's marine batteries, which embody the accumulated experience gathered over the past thirty years in the development of lead acid batteries.

Three illustrated leaflets have been issued by Sentinel (Shrewsbury), Ltd., giving details of three products of the company, the Sentinel alternator power unit 6SRH2/A, the Sentinel 2-cylinder industrial diesel engine, and the Sentinel industrial power unit 4SRH2.

The Docks & Inland Waterways Executive has produced an illustrated booklet entitled *British Waterways* (price, 2s. 6d.), which describes in some detail the system of inland waterways operated by the Executive. It also gives the maximum dimensions of craft capable of navigating the various sections.

The Anglo-American Council on Productivity has issued a report on *Hot Dip Galvanising*, based on observations made in the autumn of 1950 during a tour of America sponsored by the Council with E.C.A. technical assistance. It is stated that many of the technical processes in works visited were simpler and less efficient than modern British practice, and the conclusion is reached that the British and Americans have each something to teach the other.

SUBMARINE CABLES IN NORTH SEA

The Mine Danger in Cable Laying and Repair

The official opening of the new Netherlands-Denmark telephone communication system took place on September 28. The Netherlands and Danish Post, Telegraphs and Telephones Administrations decided, early in 1948, that the system should include duplicate submarine cables, each 142 nautical miles in length, to be laid between the north coast of the Netherlands and the Danish island of Romo. The contract for the submarine cables was placed with Submarine Cables, Ltd., Telcon Works, Greenwich, London, while the supply of the submerged repeaters and terminal equipment was entrusted to Standard Telephones & Cables, Ltd., London. Submarine Cables, being responsible also for the laying of the cables, secured, with the help of the naval authorities, a mine-swept channel one mile in width in which to lay the two cables half a nautical mile apart. The shore ends were laid first by the Danish and Netherlands cable ships *Krarup* and *Poolster* respectively. H.M. cable ship *Monarch*, chartered by Submarine Cables, Ltd., from the British Post Office, spliced the main cable to the first of the Romo shore ends on August 24 and completed the laying by splicing to the second shore end off Oostmahorn on September 2, 1950. The initial installation provides for 36 telephone circuits on each cable, but this capacity can be greatly increased by the provision of more submerged repeaters. The cables were designed with this in view, and are the largest solid dielectric submarine coaxial cables yet laid.

Under the auspices of the International Mine Clearance Organisation, the 4th Minesweeping Flotilla, led by H.M.S. *Bramble*, is shortly to undertake a special sweep to render safe an area in which the repair of a broken cable is to be carried out. The cable is Danish owned and forms part of the communications system between Denmark and France. The break is about 40 miles north of Den Helder. The first step in this deep sweep, intended to clear any stray mines lying on the bottom, will be the location of the break by equipment owned by the Danish company and installed in H.M.S. *Rinaldo*. Signal impulses will be sent out from Denmark and these will be picked up by the electronic search gear. This method of location is expected to enable H.M.S. *Rinaldo* to buoy the exact position. When the mine clearance of the area is completed the Danish cable ship *Edouard Svensen* will go out to grapple the cable and repair it.

Forthcoming Technical Papers

The opening meeting of the North-East Coast Institution of Engineers and Shipbuilders' sixty-eighth session, 1951-52, will be held on October 26, at which Dr. J. W. Fisher will read a paper on "Photography at Sea of Ship and Propeller Cavitation." The Andrew Laing Lecture will be delivered on November 7 by Prof. J. F. Baker, head of the department of engineering, Cambridge University. His subject will be "Shortcomings of Structural Analysis." Other papers to be read in the 1951-52 programme include: "An Analysis of Ship Vibration using Basic Functions," by J. E. Richards; "External Ship Corrosion due to Bacterial Action," by Dr. W. S. Patterson; "Marine Propulsion Miscellany," by Dr. E. V. Telfer; "Fuelling at Sea," by I. McD. Black; "Estimation of Ships' Engine Power from Model Experiment Results," by J. L. Kent; "Fuel Injection Systems for Large Marine Engines," by P. Jackson; "Application of Aluminium to Ship Constructions," by E. C. B. Corlett; "Concerning Steam Turbines for Marine Use," by J. Brown; "Modern Foundry Practice," by T. W. Bushell; and "The Measurement of Actual Stress of Propeller Blades Under Service Conditions," by T. W. Bunyan.

The following arrangements have been made for the first half of the 1951-52 session of the Institution of Engineers and Shipbuilders in Scotland. On October 9 the presidential address will be given by Sir Andrew McCance. The programme continues with a paper by J. Venus on "Marine Developments in Aluminium," on October 23; on November 6, "Some Aspects of Research in Friction and Wear," by F. T. Barwell; November 20, "The History and Development of Machinery for Paddle Steamers," by G. E. Barr; December 4, "The Manufacture of Steel Chain and Slings," by W. G. Biggart. All meetings will be held at 39 Elmbank Crescent, Glasgow.

RADIO equipment fitted by the Marconi International Marine Communication Co., Ltd., in the new Norwegian tanker *Buesten* comprises an "Oceanspan" transmitter, a "Lodestone" direction-finder and a "Vigilant" auto-alarm.

THE THAMES LIGHTER "NAUGHTON"

FIRST VESSEL BUILT AT BERWICK FOR SIXTY YEARS

THE first vessel to be built at Berwick for sixty years has entered service with the London & Rochester Trading Co., Ltd. She is the motor lighter *Naughton*, constructed at the yard of William Weatherhead & Sons on behalf of the Fairmile Construction Co., Ltd. The *Naughton* is an addition to a fleet of about 70 motor lighters and other craft operated by the owners in the Thames-Medway service, and is at present engaged in carrying cement from the Medway to London, returning with timber, paper or other merchandise every five to six days.

Designed by Mr. Sydney Graham, a consulting naval architect who was on the Fairmile staff throughout the Second World War, the *Naughton* is the first steel motor vessel to be delivered by William Weatherhead & Sons, and is the first of a new type of motor lighter designed by Fairmile for her owners. She is also the first of 16 craft, including dumb and self-propelled steel vessels and two tugs, to be completed by the yard, which is building exclusively for the Fairmile Construction Co., Ltd. Work is now in progress on the construction of a sister ship, to be named *Gold*, which will be completed before the end of the year.

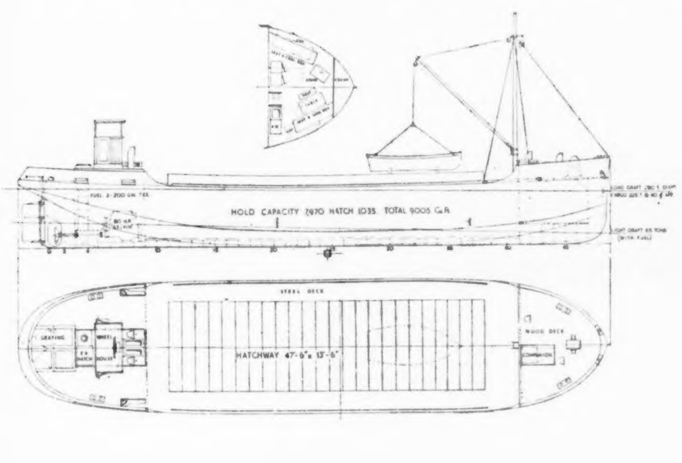
Single Hold

With an overall length of 89 ft., a length b.p. of 85 ft., a breadth moulded 20 ft. and a depth of 9 ft., the *Naughton* carries 220 tons of general cargo on a draught of 8 ft. 1 in. It is estimated, however, that she can carry 240 tons on the 3-in. freeboard permitted by the Port of London Authority. She has a maximum light draught of 2 ft. 7 in. There is a single cargo hold with a capacity of 9,005 cu. ft. Quarters for a crew of two are arranged forward, while the propelling machinery is situated aft. Over the machinery space, which houses tankage for 400 gallons of fuel, is situated a light steering shelter.

The hull is of double chine form, the ½-in. side plating having butt straps at the seams, and ⅜-in. bilge plating flanged at sides and bottom. In future boats of this design the edges will be butt welded, disposing of the butts and flanges. The frames, of 5 in. by 3 in. by 5/16 in. angle, are spaced at 21-in. intervals. On trials the 66-h.p. Kelvin diesel engine gave the vessel a maximum speed of about 5½ knots. The builders are considering fitting a more powerful Kelvin engine in subsequent craft of this design, and are arranging for Ministry of Transport classification so that coastal trading can be regularly undertaken.

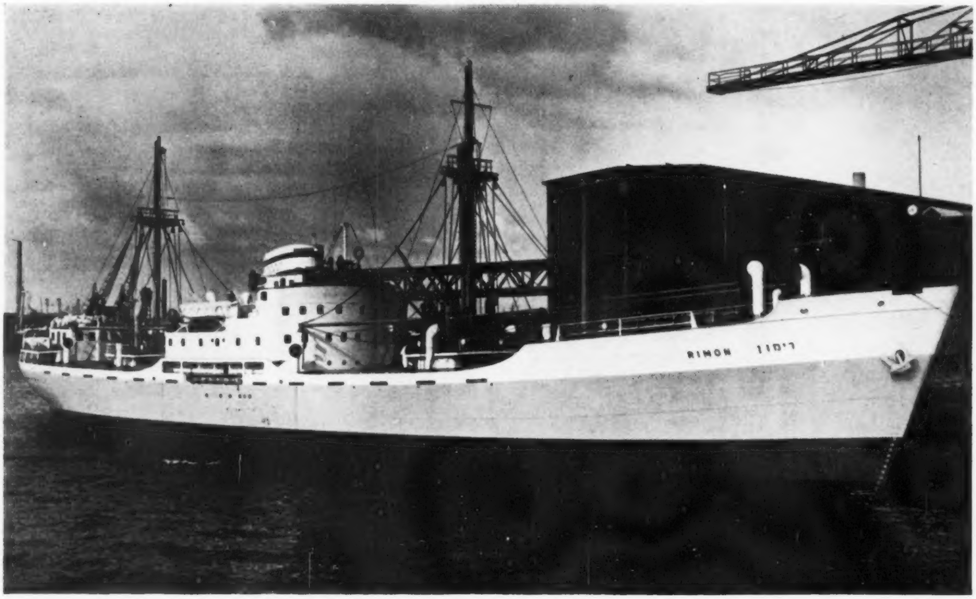
New Type Freezing Plant for Trawlers

Information was given at the meeting of the International Congress of Refrigeration held in London of a new type of freezing plant for use on board trawlers. Giving details of the new plant, Dr. Reay, of the Torry Research Station, Aberdeen, said that it was smaller, cheaper and more efficient than previous freezing units. Use of the plant, which is now on test at the research station, would permit the average smaller sea trawler to quick freeze its catch and thus ensure a fresh delivery from distant waters. The most promising design is a direct expansion contact freezer with movable vertical plates. It can freeze at normal evaporating temperatures blocks of five inches thick. Dr. Reay was discussing methods of preserving catches and stressed that quick freezing appeared to offer the only likely method of improving quality of the entire catch of distant-water fish. He urged avoidance of delay in stowing the use of better distribution of ice in relation to heat transfer of the old and shallower stowage on shelves or in boxes. The Torry Research Station has recently carried out checks and surveys on two commercial trawler voyages to the Arctic.



Profile and plan of the steel motor lighter "Naughton," built at the yard of William Weatherhead & Sons, Berwick-on-Tweed, on behalf of the Fairmile Construction Co., Ltd., for the London & Rochester Trading Co., Ltd.

MOTORSHIPS FOR ISRAELI AND SWEDISH OWNERS



First New Ship for Israel

The *Rimon*, a motor vessel of 3,998 tons deadweight, was launched last April and has now been completed by Rotterdamsche Droogdok Maatschappij for the Zim Israel Navigation Co., Ltd. She is the first of two 2,300 tons gross fruit carriers for the Zim fleet. The *Rimon* has an overall length of 352 ft. 7 in., the length between perpendiculars being 326 ft. 5½ in., with a breadth of 46 ft. 7 in. and a depth of 19 ft. 7 in. There is accommodation for 12 passengers in six cabins and a cargo capacity of 276,670 cu. ft. (grain). The propelling machinery consists of a 10-cylinder diesel engine, developing 3,000 h.p. and giving the vessel a speed of 14 knots

New Tanker from Gotaverken

The tanker *Bellona* is the fourth vessel to be built by Gotaverken for the A.O. Anderson Shipping Co., A S, Oslo. Of 11,050 tons gross and 17,270 tons deadweight, she has an overall length of 540 ft. 8 in., a moulded breadth of 66 ft., a depth of 39 ft. 3 in. and a mean draught of 30 ft. 3 in. She is propelled by a 9-cylinder two-stroke single-acting Gotaverken diesel engine with a cylinder diameter of 680 mm. and a stroke of 1,500 mm. The engine develops 8,000 i.h.p. at 112 r.p.m., giving a loaded speed of 14½ knots. The *Bellona*, which was delivered on September 11, has been built to the highest class of Det Norske Veritas. The figurehead, shown in the above photograph, represents the Goddess of War, Bellona

NEW CONTRACTS

Yards in Great Britain and Northern Ireland

Shipowners	No. of Ships	Type	Approximate Tonnages: Gross	Approximate Tonnages: Deadweight	Dimensions (ft.)	Speed (knots)	Propelling Machinery	Total h.p.	Engine Builders	Shipbuilders
Skibs A/S Dalfonn, Stavanger	1	Tanker	—	18,000	—	—	Steam turbine	—	—	Harland & Wolff, Belfast
Nigerian Govt.	1	Survey vessel	—	—	150 b.p. × 27.5	—	Tr.-exp. steam	—	—	J. Samuel White
Sugar Line	1	Bulk sugar carrier	—	9,500	25 (draught)	12	4-cyl. Doxford diesel	—	—	Cammell Laird
Sugar Line	4	Bulk sugar carriers	—	9,500 (each)	25 (draught)	12	4-cyl. Doxford diesel	—	Hawthorn, Leslie & Co.	R. & W. Hawthorn, Leslie & Co.; and Smith's Dock (2 each)
Sugar Line	2	Bulk sugar carriers	—	9,500 (each)	25 (draught)	12	4-cyl. Doxford diesel	—	Shipbuilders	Scotts' S.B.

Commonwealth and Foreign Yards

Shipowners	No. of Ships	Type	Approximate Tonnages: Gross	Approximate Tonnages: Deadweight	Dimensions (ft.)	Speed (knots)	Propelling Machinery	Total h.p.	Engine Builders	Shipbuilders
Three New York owners	3	Tankers	—	31,000 (each)	—	—	—	—	—	Ch. et Atel. de St. Nazaire (Penhoet), St. Nazaire (2); and Atel. et Ch. de France, Dunkirk (1)
Achille Lauro, Naples	2	Tankers	—	26,700	590.6 × 82	16	Steam turbine	—	—	Soc. per Az. Ansaldo, Sestri Ponente
Rederi A/B Re-Ee, Helsinki	1	Cargo	—	9,400	—	—	Diesel	—	—	Oskarshamns Varv
Det Sondenfjelds Norske Damps., Oslo	1	Cargo	—	1,875	—	12.5	Diesel	—	—	Norrkopings Varv & Verkstad
Ertse Deutsche Walfang-Ges., Hamburg	1	Refrig. cargo	1,300	—	—	—	Diesel	1,400	—	Mutzelfeldt-Werft., Cuxhaven
Swedish owners	1	Coaster	300	—	—	—	Diesel	—	—	Roland-Werft, Bremen-Hemelingen
Reederei August Cords, Bremen	1	Cargo	2,700	5,050	—	14	Diesel	—	—	Rickmers Werft, Bremerhaven
Deutsche Hochseefischeree, Bremerhaven	1	Trawler	600	—	—	—	Steam	—	—	Rickmers Werft, Bremerhaven
Reederei Odin G.m.b.H., Lubeck	1	Cargo	300	430	—	—	Diesel	—	—	W. & E. Sielaff, Busum
Cie. Maritime Belge, Antwerp	2	Cargo liners	—	9,500 (each)	456.1 b.p. × 61.4 × 27 (draught)	16	6-cyl., 2-str. B. & W. diesel	6,200 (each)	S. A. John Cockerill	S. A. John Cockerill, Hoboken; and Nakskov Skibs. (1 each)
Skibs A/S Skytteren, Tonsberg	1	Cargo liner	—	9,150	—	14.5	B. & W. diesel	—	—	Eriksbergs M.V., Gothenburg
Leonhardt & Blumberg, Hamburg	1	Cargo	—	10,000	—	13	—	—	—	Flensburger Schiffbau-Ges.
F. Laeisz, Hamburg	1	Cargo	1,250	2,150	262.5 o.a. × 37.7 × 15.7	12.5	M.A.K. diesel	1,500	—	Werft Nobiskrug, Rendsburg
Weidtmann & Ballin, Hamburg	1	Cargo	850	1,400	—	—	M.A.K. diesel	850	—	D. W. Kremer Sohn, Elmshorn
Hanseatische Reederei Emil Offen & Co., Hamburg	1	Cargo	—	1,100	—	11	Diesel	800	—	A. G. Weser, Bremerhaven
Leif Hoegh & Co., Oslo	2	Cargo liners	—	5,000 (each)	—	—	—	—	—	Jos. Boel & Fils, Tamise
Kon. Hollandsche Lloyd, Amsterdam	1	Cargo	—	8,000	—	15	7-cyl. diesel	5,000	Sulzer Bros., Winterthur	C. van der Giessen & Zonen's Scheeps., Krimpen a/d Yssel
N.V. Vereenigde Nederlandsche Scheepv., The Hague	1	Cargo	6,300	—	—	16	B. & W. diesel	7,200	—	P. Smit, Jnr., Rotterdam
N.V. Vereenigde Nederlandsche Scheepv.	1	Cargo	6,300	—	—	16	Stork diesel	7,200	—	Netherlands Dock & S.B. Co., Amsterdam

LAUNCHES

Yards in Great Britain and Northern Ireland

Date	Shipowners	Ship's Name and/or Yard No.	Type	Approximate Tonnages: Gross	Approximate Tonnages: Deadweight	Dimensions (ft.)	Speed (knots)	Propelling Machinery	Total h.p.	Engine Builders	Shipbuilders
Sept. 19	Elder Dempster Lines	*Eboe* (655)	Cargo	9,500	—	465 × 64 × 36	16-18	Doxford diesel	8,000	Shipbuilders	Scotts' S.B.
Sept. 19	Constants (South Wales)	*Garlinge* (1252)	Cargo	3,000	4,650	320 b.p. × 46.33 × 24.3	10.5	Tr.-exp. steam	—	Shipbuilders	Wm. Gray
Sept. 19	J. Marr & Son	*Irvana* (852)	Trawler	330	—	140 o.a. and 123.5 b.p. × 26.5	—	7-cyl. Mirrlees diesel	700	—	Cook, Welton & Gemmell

Commonwealth and Foreign Yards

Date	Shipowners	Ship's Name and/or Yard No.	Type	Approximate Tonnages: Gross	Approximate Tonnages: Deadweight	Dimensions (ft.)	Speed (knots)	Propelling Machinery	Total h.p.	Engine Builders	Shipbuilders
Sept. 18	Lloyd Triestino	*Victoria* (1765)	Passenger liner	11,600	—	—	20	Tw.-scr. diesel	—	—	Cant. Riuniti dell'-Adriatico, Trieste
Sept. 20	Rederi A/S Ruth, Oslo	*Fermland* (654)	Tanker	10,100	15,800	515.16 o.a. × 64 × 38.16	14.5	8-cyl., 2-str. diesel	7,350	Shipbuilders	Gotaverken, Gothenburg

TRIAL TRIPS

Commonwealth and Foreign Yards

Date	Shipowners	Ship's Name and/or Yard No.	Type	Approximate Tonnages: Gross	Approximate Tonnages: Deadweight	Dimensions (ft.)	Speed (knots)	Propelling Machinery	Total h.p	Engine Builders	Shipbuilders
—	Leonhardt & Blumberg, Hamburg	*Adolf Leonhardt* (S.629)	Cargo	7,200	13,000	475 × 63.33 × 26 (draught)	—	2-str. M.A.N. diesel	3,600	—	Deutsche Werft, Hamburg
—	Lloyd Triestino	*Neptunia* (1760)	Passenger liner	13,000	—	501 × 69.4 × 28.6	19	Tw.-scr., 5-cyl., 2-str. diesel	—	Shipbuilders	Cant. Riuniti dell'-Adriatico, Trieste
Aug. —	V/O Machino-import, Moscow	*Amur*	Trawler	756	468	206.75 o.a. × 30.5 × 15.92	12	Dble.-compound Fredriksstad steam motor	800	—	Gavle Varv

CAPT. CHENG-MOO LIU is the newly-appointed general manager of the China Union Lines, Ltd. Capt. Liu served an apprenticeship with Alfred Holt & Company. He later served on coasters of the China Merchants Steamship Navigation Company, joining the Chinese Maritime Customs in 1931. In 1946 he returned to the China Merchants Steamship Navigation Co. as port captain in the marine department. He was appointed manager of the marine department in 1949, at the same time becoming marine superintendent of the Taiwan Steam Navigation Company, of Formosa

CAPT. E. A. SHERGOLD has been appointed general superintendent for Canadian Pacific Steamships, Ltd., in the United Kingdom. His appointment became effective on October 1, when he took up his post in Liverpool. Since the war Capt. Shergold has commanded first the *Empress of Canada* and since May, 1950, the *Empress of Scotland*. He served first with Canadian Pacific as third officer in the *Missanabie*, which was torpedoed in 1918. In 1934-40 he served with the *Duchess of Richmond* (later *Empress of Canada*) as second officer. His first command was the *Empire Union*, in 1941

MARITIME NEWS IN BRIEF

From Correspondents at Home and Overseas

A PROVISIONAL agreement has been reached between the Scindia Steam Navigation Co., Ltd., and the Indian Government for the establishment of a State shipbuilding enterprise next January, when the State takes over India's only shipbuilding yard at Vizagapatam, at present owned by the Scindia company. The Government is subscribing two-thirds of a capital of 35 million rupees (£2,625,000), and the Scindia company the remainder. The building of coastal vessels will start immediately. Three foreign experts are being asked to assist in developing the yard.

According to figures compiled by the Japanese Ministry of Transport, Japan had 176 vessels totalling 1,580,277 tons in overseas service on September 1. Of the total, 150 were dry-cargo vessels, of 1,183,263 tons, and 26 tankers, of 356,964 tons. None of the ships is yet trading with European countries. There are 34 cargo ships in service from Japan to the east and west coasts of the United States.

Due to the ill health of the King it has been decided to postpone the reception on November 8 at which the King was to have laid the foundation stone of Lloyd's new building. The Corporation of Trinity House has also cancelled the ceremony of laying the foundation stone of its new building on October 24, which was to have been undertaken by the King.

Mr. Nicholas Szilasi, manager of the tank chartering department of Harris & Dixon, Ltd., and a director of Harris & Dixon (Oil), Ltd., has been appointed a director of the parent company, Harris & Dixon, Ltd., with whom he has served for 28 years.

Mr. L. G. Sharpe has been appointed head of the general stores department at the head office in London of Royal Mail Lines, Ltd., in succession to Mr. H. C. Shorey, who is due to retire on October 6 after 48 years' service.

Walford Lines, Ltd., have been appointed sole European agents for the salvage section of the Turkish Maritime Lines and Ports Administration, Istanbul.

* * * *

The Institute of Marine Engineers announce that the next examinations for admission to the Institute will be held as follows: Students (common preliminary examination), April 1 to 4 and October 7 to 10, 1952; Graduates (sections A and B of the associateship membership examination), April 28 to May 21, 1952; and Associate Members, April 28 to May 22, 1952. Further particulars and syllabuses of these examinations can be obtained from the secretary of the Institute, 85 Minories, London, E.C.3.

Total tolls collected in July for vessels using the Panama Canal amounted to $1,984,000, compared with $1,981,000 in the previous month. A sum of $200,000 has been credited to the Panama Canal Company for the use of the canal by Government vessels, the first time since the canal was built. Before the new company took over the administration of the canal on July 1 no Government ships paid tolls.

The annual national service for seafarers will be held in St. Paul's Cathedral on October 24, at 5.45 p.m., when the address will be given by the Right Rev. The Lord Bishop of Rochester. All who are interested in seafarers will be welcome, and early application for tickets should be made to the honorary secretary, Mr. W. T. C. Smith, H.Q.S. *Wellington*, Temple Stairs, Victoria Embankment, London, W.C.2.

Dr. E. C. Rollason, formerly a delegate director and research manager of Murex Welding Processes, Ltd., has taken up his appointment to the Henry Bell Wortley Chair of Metallurgy at Liverpool University. His successor as research manager is Dr. W. I. Pumphrey.

The inaugural address of the Manchester Association of Engineers will be given by the president, Mr. F. Buckingham, at the opening meeting of the 1951-52 session on October 5 at 6.30 p.m. in the Engineers' Club, Albert Square, Manchester.

Mr. N. P. Newman, managing director of Newman, Hender & Co., Ltd., has been elected chairman of the British Valve Manufacturers' Association.

* * * *

An exhibition of recent acquisitions has been opened at the National Maritime Museum, Greenwich. An interesting Portulan chart is that by William Borough (about 1580) showing the way to the Baltic, while a pair of globes of about 1690 illustrates the work of Morden, Berry and Lea. Only one other pair of globes by these makers is known in the country. Also exhibited is the log book kept in the *Betsy* in 1770 by the marine painter Nicholas Pocock, and illustrated by him, and a letter from Matthew Flinders to his parents written while serving in H.M.S. *Reliance*.

The sixth annual exhibition of the Society of Marine Artists will be opened at the Guildhall, London, on October 11 by Lord Lloyd of Dolobran. The exhibition will remain open daily from 10 a.m. to 5 p.m., excepting Sundays, until November 3.

The Derwenthaugh Staithes near Newcastle-on-Tyne, which were extensively damaged by fire some time ago, are being repaired and are expected to be in operation again by the end of the year.

Lambert Brothers, Ltd., announce with regret that their deputy chairman, Mr. F. C. Johnson, who has been with them over 49 years, has tendered his resignation for reasons of health.

Mr. G. Daniel, chief ship surveyor of the Ministry of Transport since 1945, is to retire at his own request on November 30, and will be succeeded by Mr. H. E. Steel, the present deputy chief ship surveyor.

Mr. William White has retired as dry dock manager of R. & W. Hawthorn, Leslie & Co., Ltd., after holding the position for 23 years. He is succeeded by Mr. Boyd, formerly with the Blyth Dry Dock & Shipbuilding Co., Ltd.

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Further particulars and application forms from Secretary, Civil Service Commission, Trinidad House, Old Burlington Street, London, W.1, quoting No. S.201-202/51. Completed application forms must be returned by 15th November, 1951.

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